



*Received of the  
Honorable the  
Governor of the  
Province of New York  
the sum of \$100.00  
for the purchase of  
the land of the  
State of New York  
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*ASIATICK RESEARCHES;*

OR,

TRANSACTIONS

OF THE

SOCIETY INSTITUTED IN BENGAL,

FOR INQUIRING INTO THE

HISTORY AND ANTIQUITIES,

THE

ARTS, SCIENCES, AND LITERATURE,

OF

*A S I A.*

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VOLUME THE FIRST.

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THE FIFTH EDITION,

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AND J. ASPERNE.

1806.





THE  
INTRODUCTION.

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IF this first Publication of the ASIATICK SOCIETY should not answer those expectations which may have been hastily formed by the learned in *Europe*, they will be candid enough to consider the disadvantages which must naturally have attended its institution, and retarded its progress. A mere man of letters, retired from the world, and allotting his whole time to philosophical or literary pursuits, is a character unknown among *Europeans* resident in *India*, where every individual is a man of business in the civil or military state, and constantly occupied either in the affairs of government, in the administration of justice, in some department of revenue or commerce, or in one of the liberal professions. Very few hours, therefore, in the day or night, can be reserved for any study, that has no immediate connection with business, even by those who are most habituated to mental application: and it is impossible to preserve health in *Bengal*, without regular exercise, and seasonable relaxation of mind: not to insist that, in the opinion of an illustrious *Roman*, “No one can be said to enjoy liberty, “who has not sometimes the privilege of doing nothing.” All employments, however, in all countries, afford some intervals of leisure; and there is an active spirit in *European* minds, which no climate, or situation in life, can wholly repress, which justifies the ancient notion, that *a change of toil is a species of repose*; and which seems to consider nothing done or learned, while any thing remains unperformed or unknown. Several *Englishmen*, therefore, who resided in a country, every part of which abounds in objects of curious and useful speculation, concurred in opinion, that a Society instituted at *Calcutta*, on the plan of those established in the principal cities of *Europe*, might possibly be the means of concentrating all the valuable knowledge which might occasionally be attained in *Asia*; or of preserving at least many little tracts and essays, the writers of which might



not think them of sufficient importance for separate publication. The ASIATICK SOCIETY was accordingly formed on the 15th of *January*, 1784, by those Gentlemen whose names are distinguished by asterisks in the List of Members at the end of this book ; and ample materials have already been collected for two large volumes, on a variety of new and interesting subjects. By this Publication the Institution may be considered as having taken root ; but the plant will flourish or fade, according as the activity or remissness of the Members and their correspondents shall promote or obstruct its growth. It will flourish, if naturalists, chemists, antiquaries, philologists, and men of science, in different parts of *Asia*, will commit their observations to writing, and send them to the President or the Secretary at *Calcutta* ; it will languish, if such communications shall be long intermitted ; and it will die away, if they shall entirely cease : for it is morally impossible that a few men, whatever be their zeal, who have great public duties to discharge, and difficult private studies connected with those duties, can support such an establishment without the most assiduous and eager auxiliaries.

Before we proceed to give a short history of the institution, it may be proper to declare, that the Society will pass no decision, in their *collective* capacity, on any point of literature or philosophy ; but that the writers of such dissertations, as they shall think worthy to be published from time to time, must hold themselves individually responsible for their own opinions ; a declaration which is conformable, we believe, to the practice of similar Societies in *Europe*.

It having been resolved to follow, as nearly as possible, the plan of the *Royal Society at London*, of which the *King* is *Patron*, it was agreed, at the first regular meeting, that the following Letter should be sent to the Governor-General and Council, as the *Executive Power* in the Company's territories : and their answer, which is also subjoined, was received in the course of the next month.

To the Honourable WARREN HASTINGS, Esq.  
Governor-General, President ;

EDWARD WHEELER, JOHN MACPHERSON,  
And JOHN STABLES, Esquires,  
Members of the Council of Fort William, in Bengal.

Honourable SIR and GENTLEMEN,

A SOCIETY, of which we are Members, having been instituted for the Purpose of enquiring into the History, Civil and Natural, the Antiquities, Arts, Sciences, and Literature of *Asia*, we are desirous that you will honour us with accepting the Title of our *Patrons*, and request you to consider this Application as a Token of the great Respect with which we are,

Honourable SIR and GENTLEMEN,

Your most obedient and most humble Servants,

JOHN HYDE,  
WILLIAM JONES,  
JOHN CARNAC,  
DAVID ANDERSON,  
WILLIAM CHAMBERS,  
FRANCIS GLADWIN,  
JONATHAN DUNCAN,  
THOMAS LAW,  
CHARLES WILKINS,  
JOHN DAVID PATERSON,  
CHARLES CHAPMAN,  
CHARLES HAMILTON,  
GEORGE HILARO BARLOW,

Calcutta, January 22, 1784.



## THE ANSWER.

GENTLEMEN,

WE very much approve and applaud your endeavours to promote the extension of knowledge by the means which your local advantages afford you in a degree, perhaps, exceeding those of any part of the *Globe*; and we derive great hopes of your attainment of so important an end, from our personal knowledge of the abilities and talents of the Gentlemen whose names we read in the subscription to your address.

We accept the title you have been desirous of conferring upon us of *Patrons* to your Society, and shall be happy to avail ourselves of any occasion that may occur of contributing to its success.

We are, GENTLEMEN,

Your most obedient humble Servants,

WARREN HASTINGS,  
EDWARD WHELER,  
JOHN MACPHERSON,  
JOHN STABLES.

Mr. HASTINGS *therefore appeared, as Governor-General, among the Patrons of the new Society; but he seemed, in his private station, as the first liberal promoter of useful knowledge in Bengal, and, especially as the great encourager of Persian and Sanscrit literature, to deserve a particular mark of distinction; and he was accordingly requested, in a short letter, to accept the title of President. It was, indeed, much doubted whether he would accept any office, the duties of which he could not have leisure to fulfil; but an offer of the honorary title was intended as a tribute of respect, which the occasion seemed to demand, and which could not have been omitted without an appearance of inattention to his distinguished merit. His answer is also annexed.*

---

GENTLEMEN,

**I** AM highly sensible of the honour which you have been pleased to confer upon me, in nominating me to be the President of your Society; and I hope you will both admit and approve the motives which impel me to decline it.

From an early conviction of the utility of the Institution, it was my anxious wish that I might be, by whatever means, instrumental in promoting the success of it; but not in the mode which you have proposed, which, I fear, would rather prove, if of any effect, an incumbrance on it.

I have not the leisure requisite to discharge the functions of such a station: nor, if I did possess it, would it be consistent with the pride which every man may be  
 allowed



allowed to avow in the pursuit or support of the objects of his personal credit, to accept the first station in a department, in which the superior talents of my immediate followers in it would shine with a lustre, from which mine must suffer much in the comparison; and to stand in so conspicuous a point of view, the only ineffective member of a body which is yet in its infancy, and composed of members with whose abilities I am, and have long been, in the habits of intimate communication, and know them to be all eminently qualified to fill their respective parts in it.

On these grounds I request your permission to decline the offer which you have done me the honour to make to me, and to yield my pretensions to the Gentleman whose genius planned the Institution, and is most capable of conducting it to the attainment of the great and splendid purposes of its formation.

I at the same time earnestly solicit your acceptance of services in any way in which they can be, and I hope that they may be, rendered useful to your Researches.

I have the honour to be, GENTLEMEN,

Your most obedient and most humble Servant,

WARREN HASTINGS.

Fort William,  
January 30, 1784.

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*On the receipt of this Letter, SIR WILLIAM JONES was nominated President of the Society; and, at their next meeting, he delivered the following Discourse.*

A  
DISCOURSE  
ON THE  
INSTITUTION OF A SOCIETY  
FOR INQUIRING INTO THE  
HISTORY, CIVIL AND NATURAL,  
THE  
ANTIQUITIES, ARTS, SCIENCES,  
AND LITERATURE,  
OF  
ASIA.  
BY THE PRESIDENT.

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*Gentlemen,*

WHEN I was at sea last August, on my voyage to this country, which I had long and ardently desired to visit, I found one evening, on inspecting the observations of the day, that *India* lay before us, and *Persia* on our left, whilst a breeze from *Arabia* blew nearly on our stern. A situation so pleasing in itself, and to me so new, could not fail to awaken a train of reflections in a mind which had early been accustomed to contemplate with delight, the eventful histories and agreeable fictions of this eastern world. It gave me inexpressible pleasure to find myself in the midst of so noble an amphitheatre, almost encircled by the vast regions of *Asia*, which has ever  
been



been esteemed the nurse of sciences, the inventress of delightful and useful arts, the scene of glorious actions, fertile in the productions of human genius, abounding in natural wonders, and infinitely diversified in the forms of religion and government, in the laws, manners, customs, and languages, as well as in the features and complexions of men. I could not help remarking how important and extensive a field was yet unexplored, and how many solid advantages unimproved: and when I considered, with pain, that, in this fluctuating, imperfect, and limited condition of life, such inquiries and improvements could only be made by the united efforts of many, who are not easily brought, without some pressing inducement, or strong impulse, to converge in a common point, I consoled myself with a hope, founded on opinions, which it might have the appearance of flattery to mention, that, if in any country, or community, such an union could be effected, it was among my countrymen in *Bengal*; with some of whom I already had, and with most was desirous of having, the pleasure of being intimately acquainted.

You have realized that hope, Gentlemen, and even anticipated a declaration of my wishes, by your alacrity in laying the foundation of a Society for inquiring into the History and Antiquities, the Natural Productions, Arts, Sciences, and Literature, of *Asia*. I may confidently fortel, that an institution so likely to afford entertainment, and convey knowledge, to mankind, will advance to maturity by slow, yet certain, degrees; as the Royal Society, which, at first, was only a meeting



of a few literary friends at *Oxford*, rose gradually to that splendid zenith, at which a *Halley* was their secretary, and a *Newton* their president.

Although it is my humble opinion, that, in order to ensure our success and permanence, we must keep a middle course, between a languid remissness and an over zealous activity, and that the tree, which you have auspiciously planted, will produce fairer blossoms, and more exquisite fruit, if it be not at first exposed to too great a glare of sunshine, yet I take the liberty of submitting to your consideration, a few general ideas on the plan of your Society; assuring you, that, whether you reject or approve them, your correction will give me both pleasure and instruction, as your flattering attentions have already conferred on me the highest honour.

It is your design, I conceive, to take an ample space for your learned investigations, bounding them only by the geographical limits of *Asia*; so that considering *Hindustan* as a centre, and turning your eyes in idea to the north, you have on your right many important kingdoms in the eastern peninsula; the ancient and wonderful empire of *China*, with all her *Tartarian* dependencies; and that of *Japan*, with the cluster of precious islands, in which many singular curiosities have too long been concealed. Before you lies that prodigious chain of mountains which formerly, perhaps, were a barrier against the violence of the sea; and beyond them the very interesting country of *Tibet*, and the vast regions of *Tartary*, from which, as  
from



from the *Trojan* horse of the poets, have issued so many consummate warriors, whose domain has extended at least from the banks of the *Ilissus* to the mouths of the *Ganges*. On your left are the beautiful and celebrated provinces of *Iran*, or *Persia*; the unmeasured, and, perhaps, unmeasurable, deserts of *Arabia*; and the once flourishing kingdom of *Yemen*, with the pleasant isles that the *Arabs* have subdued or colonized: and farther westward, the *Asiatick* dominions of the *Turkish* sultans, whose moon seems approaching rapidly to its wane. By this great circumference the field of your useful researches will be inclosed: but, since *Egypt* had unquestionably an old connexion with this country, if not with *China*; since the language and literature of the *Abyssinians* bear a manifest affinity to those of *Asia*; since the *Arabian* arms prevailed along the *African* coast of the *Mediterranean*, and even erected a powerful dynasty on the continent of *Europe*; you may not be displeased occasionally to follow the streams of *Asiatick* learning a little beyond its natural boundary. And if it be necessary, or convenient, that a short name or epithet be given to our Society, in order to distinguish it in the world, that of *Asiatick* appears both classical and proper, whether we consider the place or the object of the institution; and preferable to *Oriental*, which is, in truth, a word merely relative, and though commonly used in *Europe*, conveys no very distinct idea.

If now it be asked, what are the intended objects of our inquiries within these spacious limits, we answer, MAN and NATURE; whatever is performed



formed by the one, or produced by the other. Human knowledge has been elegantly analysed according to the three great faculties of the mind, *memory*, *reason*, and *imagination*, which we constantly find employed in arranging and retaining, comparing and distinguishing, combining and diversifying, the ideas which we receive through our senses, or acquire by reflection; hence the three main branches of learning are *history*, *science*, and *art*. The first comprehends either an account of natural productions, or the genuine records of empires and states; the second embraces the whole circle of pure and mixed mathematics, together with ethicks and law, as far as they depend on the reasoning faculty; and the third includes all the beauties of imagery, and the charms of invention, displayed in modulated language, or represented by colour, figure, or sound.

Agreeably to this analysis, you will investigate whatever is rare in the stupendous fabrick of nature; will correct the geography of *Asia* by new observations and discoveries; will trace the annals, and even traditions, of those nations, who, from time to time, have peopled or desolated it; and will bring to light their various forms of government, with their institutions civil and religious. You will examine their improvements and methods in arithmetick and geometry, in trigonometry, mensuration, mechanicks, opticks, astronomy, and general physicks; their systems of morality, grammar, rhetorick, and dialectick; their skill in surgery and medicine; and their advancement, whatever it may be, in anatomy and chemistry. To this you will add researches into their agriculture,



ture, manufactures, trade; and, whilst you inquire with pleasure into their musick, architecture, painting, and poetry, will not neglect those inferior arts by which the comforts, and even elegancies, of social life are supplied or improved. You may observe that I have omitted their languages, the diversity and difficulty of which are a sad obstacle to the progress of useful knowledge; but I have ever considered languages as the mere instruments of real learning, and think them improperly confounded with learning itself: the attainment of them is, however, indispensibly necessary; and if to the *Persian, Armenian, Turkish, and Arabick*, could be added not only the *Sanscrit*, the treasures of which we may now hope to see unlocked, but even the *Chinese, Tartarian, Japanese*, and the various insular dialects, an immense mine would then be open, in which we might labour with equal delight and advantage.

Having submitted to you these imperfect thoughts on the *limits* and *objects* of our future Society, I request your permission to add a few hints on the *conduct* of it in its present immature state.

LUCIAN begins one of his satirical pieces against historians with declaring, that the only true proposition in his work was, that it should contain nothing true; and, perhaps, it may be advisable at first, in order to prevent any difference of sentiment on particular points not immediately before us, to establish but one rule, namely, to have no rules at all. This only I mean, that in the infancy of any society, there ought to be no confinement,



finement, no trouble, no expence, no unnecessary formality. Let us, if you please, for the present, have weekly evening meetings in this hall, for the purpose of hearing original papers read on such subjects as fall within the circle of our inquiries. Let all curious and learned men be invited to send their tracts to our secretary, for which they ought immediately to receive our thanks: and if, towards the end of each year, we should be supplied with a sufficiency of valuable materials to fill a volume, let us present our *Asiatick* miscellany to the literary world, who have derived so much pleasure and information from the agreeable work of *Kæmpfer*, than which we can scarce propose a better model, that they will accept with eagerness any fresh entertainment of the same kind. You will not, perhaps, be disposed to admit mere translations of considerable length, except of such unpublished essays or treatises as may be transmitted to us by native authors: but whether you will enrol, as members, any number of learned natives, you will hereafter decide, with many other questions as they happen to arise: and you will think, I presume, that all questions should be decided, on a ballot, by a majority of two thirds; and that nine members should be requisite to constitute a board for such decisions. These points, however, and all others, I submit entirely, Gentlemen, to your determination, having neither wish nor pretension to claim any more than my single right of suffrage. One thing only, as essential to your dignity, I recommend with earnestness, on no account to admit a new member, who has not expressed a voluntary desire to become so; and in that case you will not require, I suppose, any other qualification

qualification than a love of knowledge, and a zeal for the promotion of it.

Your institution, I am persuaded, will ripen of itself; and your meetings will be amply supplied with interesting and amusing papers, as soon as the object of your inquiries shall be generally known. There are (it may not be delicate to name them, but there are) many from whose important studies I cannot but conceive high expectations. And, as far as mere labour will avail, I sincerely promise, that, if, in my allotted sphere of jurisprudence, or in any intellectual excursion that I may have leisure to make, I should be so fortunate as to collect, by accident, either fruits or flowers, which may seem valuable or pleasing, I shall offer my humble *Nezr* to your Society with as much respectful zeal as to the greatest potentate on earth.





## INDIAN ARABIAN and PERSIAN

## LETTERS

*Soft and hard Breathings*

<i>Vowels</i>	a e	ha	hha	
<i>Diphthongs and Semivowels</i>				
ā ā	aā	e	ē	ya
ī	ī	o	ō	wa
u	ū	ai	au	ra
ri	rī	lri	lrī	la
â â	ê ê	î î	û û	â â

*Consonants*

ca	c'ha)		g'ha)	ṇa
ka	kha)	ga	gha)	
sa	sha	za	zha	śa
ta	t'ha)	d'a	{ d'ha }	ṇa
			{ d'ha }	
ta	{ t'ha }	da	{ dha }	na
	{ tha }		{ dha }	
pa	{ pha }	ba	{ p'ha }	ma
	{ fa }		{ va }	

*Compounds*

cha	ch,ha	ja	jha	ṇya
za	z'a	z'a	csha	jṇya

TRANSACTIONS  
OF THE  
ASIATICK SOCIETY.

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I.

A DISSERTATION

ON THE

ORTHOGRAPHY OF ASIATICK WORDS IN  
ROMAN LETTERS.

BY THE

*PRESIDENT.*

EVERY man, who has occasion to compose tracts on *Asiatick* literature, or to translate from the *Asiatick* languages, must always find it convenient, and sometimes necessary, to express *Arabian*, *Indian* and *Persian* words, or sentences, in the characters generally used among *Europeans*; and almost every writer in those circumstances, has a method of notation peculiar to himself: but none has yet appeared in the form of a complete system, so that each original sound may be rendered invariably by one appropriated symbol, conformably to the natural order of articulation,

VOL. I. B



lation, and with a due regard to the primitive power of the *Roman* alphabet, which modern *Europe* has in general adopted. A want of attention to this object has occasioned great confusion in history and geography. The ancient *Greeks*, who made a voluntary sacrifice of truth to the delicacy of their ears, appear to have altered, by design, almost all the oriental names which they introduced into their elegant, but romantic, histories: and even their more modern geographers, who were too vain, perhaps, of their own language to learn any other, have so strangely disguised the proper appellations of countries, cities, and rivers, in *Asia*, that, without the guidance of the sagacious and indefatigable Monsieur D'ANVILLE, it would have been as troublesome to follow ALEXANDER through the *Panjâb* on the Ptolemaick map of AGATHODÆMON, as actually to travel over the same country in its present state of rudeness and disorder. They had an unwarrantable method of moulding foreign names to a *Grecian* form, and giving them a resemblance to some derivative word in their own tongue. Thus they changed the *Gogra* into *Agoranis*, or *a river of the assembly*; *Uchab* into *Oxydracæ*, or *sharp-sighted*; and *Renas* into *Aornos*, or *a rock inaccessible to birds*; whence their poets, who delighted in wonders, embellished their works with new images, distinguishing regions and fortresses by properties which existed only in imagination. If we have less liveliness of fancy than the ancients, we have more accuracy, more love of truth, and, perhaps, more solidity of judgment: and if our works shall afford less delight to those in respect of whom we shall be ancients, it may be said, without presumption, that we shall give them more correct information on the history and geography of this Eastern World; since no man can perfectly describe a country who is unacquainted with the language of it. The learned and entertaining work of M. D'HERBELOT, which professes to interpret and elucidate the names of persons and places, and the titles of books, abounds also in citations from the best writers of *Arabia*  
and

and *Persia*: yet, though his orthography will be found less defective than that of other writers on similar subjects, without excepting the illustrious Prince KAN-TEMIR, still it requires more than a moderate knowledge of *Persian*, *Arabick*, and *Turkish*, to comprehend all the characters quoted by him in *European* characters; one instance of which I cannot forbear giving. In the account of *Ibnu Zaidùn*, a celebrated *Andalusian* poet, the first couplet of an elegy in *Arabick* is praised for its elegance, and expressed thus in *Roman* letters:

Iekad hein tenagikom dhamairna;  
Iacdhâ âlaina alaffa laula taffina.

“The time,” adds the translator, “will soon come, when you will deliver us from all our cares: the remedy is assured, provided we have a little patience.” When Dr. HUNT, of *Oxford*, whom I am bound to name with gratitude and veneration, together with two or three others, attempted, at my request, to write the same distich in *Arabian* characters, they all wrote it differently, and all, in my present opinion, erroneously. I was then a very young student, and could not easily have procured *Ibnu Zaidùn*’s works, which are, no doubt, preserved in the *Bodley* Library, but which have not since fallen in my way. This admired couplet, therefore, I have never seen in the original characters, and confess myself at a loss to render them with certainty. Both verses are written by *D’Herbelot* without attention to the grammatical points: that is, in a form which no learned *Arab* would give them in recitation. But, although the French version be palpably erroneous, it is by no means easy to correct the error. If *âlâsâ*, or a *remedy*, be the true reading, the negative particle must be absurd; since *taâssainâ* signifies *we are patient*, and not *we despair*: but if *âlâsay*, or *affliction*, be the proper word, some obscurity must arise from the



verb, with which it agrees. On the whole, I guess, that the distich should thus be written :

يَكَادُ حِينَ تَنَاجِيكُمْ ضَبَائِرُنَا  
يَقْضِي عَلَيْنَا الْأَسَى لَوْلَا تَأْسِينَا

*Yecádu hhína tunájícum d'emáïrunà*  
*Yakdì âlainà 'lâsay lau là taáffínà.*

“ When our bosoms impart their secrets to you, anguish would almost fix our doom, if we were not mutually to console ourselves.”

The principal verbs may have a future sense, and the last word may admit of a different interpretation. Dr. HUNT, I remember, had found in GIGGEIUS the word *dhemáyer*, which he conceived to be in the original. After all, the rhyme seems imperfect, and the measure irregular. Now I ask whether such perplexities could have arisen, if *D'Herbelot*, or his editor, had formed a regular system of expressing *Arabick* in *Roman* characters, and had apprized his readers of it in his introductory dissertation?

If a further proof be required, that such a system will be useful to the learned, and essential to the student, let me remark, that a learner of *Persian*, who should read in our best histories, the life of Sultan AZIM, and wish to write his name in *Arabick* letters, might express it *thirty-nine* different ways, and be wrong at last. The word should be written *Aâžem*, with three points on the first consonant.

There are two general modes of exhibiting *Asiatick* words in our own letters: they are founded on principles nearly opposite; but each of them has its advantages, and



and each has been recommended by respectable authorities. The first professes to regard chiefly the *pronunciation* of the words intended to be expressed; and this method, as far as it can be pursued, is unquestionably useful: but new sounds are very inadequately presented to a sense not formed to receive them; and the reader must, in the end, be left to pronounce many letters and syllables precariously; besides, that by this mode of orthography, all grammatical analogy is destroyed, simple sounds are represented by double characters, vowels of one denomination stand for those of another; and possibly, with all our labour, we perpetuate a provincial or inelegant pronunciation. All these objections may be made to the usual way of writing *Kummerbund*, in which neither the letters, nor the true sound of them, are preserved; while *Kemberbend*, or *Cemberbend*, as an ancient *Briton* would write it, clearly exhibits both the original characters, and the *Persian* pronunciation of them. To set this point in a strong light, we need only suppose that the *French* had adopted a system of letters wholly different from ours, and of which we had no types in our printing-houses: let us conceive an *Englishman*, acquainted with their language, to be pleased with MALHERBE'S well-known imitation of *Horace*, and desirous of quoting it in some piece of criticism: he would read it thus:

‘ La mort a des rigueurs à nulle autre pareilles :  
 ‘ On a beau la prier :  
 ‘ La cruelle qu’elle est se bouche les oreilles,  
 ‘ Et nous laisse crier.

‘ Le pauvre en sa cabane, ou le chaume le couvre,  
 ‘ Est sujet à ses loix,  
 ‘ Et la garde, qui veille aux barrières du *Louvre*,  
 ‘ N’en défend pas nos rois !’

Would he then express these eight verses, in *Roman* characters, exactly as the *French* themselves in fact express them; or would he decorate his composition with a passage more resembling the dialect of savages, than that of a polished nation? His pronunciation, good or bad, would, perhaps, be thus represented:

‘ Law more aw day reegyewrs aw nool otruh parellyuh,  
 ‘ Onne aw bo law preeay :  
 ‘ Law crooellyuh kellay fuh boofshuh lays orellyuh,  
 ‘ Ay noo layfuh creeay.

‘ Luh povre ong saw cawbawn oo luh chomuh luh  
 ‘ coovruh,  
 ‘ Ay foozyet aw say lwaw,  
 ‘ Aylaw gawrduh kee velly ò bawryayruh dyoo *Loovruh*,  
 ‘ Nong dayfong paw no rwaw !’

The second system of *Asiatick* orthography consists in scrupulously rendering letter for letter, without any particular care to preserve the pronunciation; and, as long as this mode proceeds by unvaried rules, it seems clearly entitled to the preference.

For the first method of writing *Persian* words, the warmest advocate, among my acquaintance, was the late Major DAVY, a member of our Society, and a man of parts, whom the world lost prematurely, at a time when he was meditating a literary retirement, and hoping to pass the remainder of his life in domestick happiness, and in the cultivation of his very useful talents. He valued himself particularly on his pronunciation of the *Persian* language, and of his new way of exhibiting it in our characters, which he instructed the learned and amiable editor of his *Institutes of Timour*, at *Oxford*,  
 to



to retain with minute attention throughout his work. Where he had acquired his refined articulation of the *Persian* I never was informed; but it is evident that he spells most proper names in a manner which a native of *Persia*, who could read our letters, would be unable to comprehend. For instance; that the capital of *Azarbáiján* is now called *Tabríz*, I know from the mouth of a person born in that city, as well as from other *Iranians*; and that it was so called sixteen hundred years ago, we all know from the *Geography of Ptolemy*; yet Major DAVY always wrote it *Tubburaze*, and insisted that it should thus be pronounced. Whether the natives of *Semerland*, or *Samarkand*, who probably speak the dialect of *Soghd* with a *Turanian* pronunciation, call their birth-place, as DAVY spelled it, *Summurkund*, I have yet to learn; but I cannot believe it; and am convinced, that the former mode of writing the word, expresses both the letters, and the sound of them, better than any other combination of characters. His method, therefore, has every defect; since it renders neither the original elements of words, nor the sounds represented by them in *Persia*, where alone we must seek for genuine *Persian*, as for *French* in *France*, and for *Italian* in *Italy*.

The second method has found two able supporters in Mr. HALHED and Mr. WILKINS; to the first of whom the public is indebted for a perspicuous and ample grammar of the *Bengal* language; and to the second for more advantages in *Indian* literature, than *Europe* or *India* can ever sufficiently acknowledge.

Mr. HALHED having justly remarked, ‘ that the two  
 ‘ greatest defects in the orthography of any language,  
 ‘ are the application of the same letter to several dif-  
 ‘ ferent sounds, and of different letters to the same  
 ‘ sound,’ truly pronounces them both to be ‘ so com-  
 ‘ mon in *English*, that he was exceedingly embarrassed  
 ‘ in the choice of letters to express the sound of the



‘ *Bengal* vowels, and was at last by no means satisfied with his own selection.’ If any thing dissatisfies me, in his clear and accurate system, it is the use of *double* letters for the long vowels, (which might, however, be justified,) and the frequent intermixture of *Italick* with *Roman* letters in the same word; which, both in writing and printing, must be very inconvenient. Perhaps it may be added, that his diphthongs are not expressed analogously to the sounds of which they are composed.

The system of Mr. WILKINS has been equally well considered; and Mr. HALHED himself has, indeed, adopted it in his preface to the *Compilation of Hindu Laws*. It principally consists of double letters, to signify our third and fifth vowels; and of the common prosodial marks, to ascertain their brevity or their length: but those marks are so generally appropriated to books of prosody, that they never fail to convey an idea of metre. Nor, if *either* prosodial sign were adopted, would *both* be necessary; since the omission of a long mark would evidently denote the shortness of the unmarked vowel, or conversely. On the whole, I cannot but approve this notation for *San scrit* words, yet require something more universally expressive of *Asiatick* letters. As it is perfect, however, in its kind, and will appear in the works of its learned inventor, I shall annex, among the examples, four distichs from the *Bhágawat*, expressed both in his method and mine\*. A translation of them will be produced on another occasion. But, in order to render this tract as complete as possible, a fuller specimen of *San scrit* will be subjoined with the original, printed in the characters of *Bengal*, into which the *Bráhmans* of that province transpose all their books, few of them being able to read the *Dévanágari* letters; so far has their indolence prevailed over their piety!

Let

Let me now proceed, not prescribing rules for others, but explaining those which I have prescribed for myself, to unfold my own system, the convenience of which has been proved by careful observation and long experience.

It would be superfluous to discourse on the organs of speech, which have been a thousand times dissected, and as often described, by musicians or anatomists; and the several powers of which every man may perceive, either by the touch or by sight, if he will attentively observe another person pronouncing the different classes of letters, or pronounce them himself distinctly before a mirror: but a short analysis of articulate sounds may be proper to introduce an examination of every separate symbol.

*All things abound with error*, as the old searchers for truth remarked with despondence: but it is really deplorable that our first step from total ignorance should be into gross inaccuracy; and that we should begin our education in *England* with learning to read *the five vowels*, two of which, as we are taught to pronounce them, are clearly diphthongs. There are, indeed, five simple vocal sounds in our language, as in that of *Rome*, which occur in the words *an innocent bull*, though not precisely in their natural order; for we have retained the true arrangement of the letters, while we capriciously disarrange them in pronunciation; so that our eyes are satisfied, and our ears disappointed. The primary elements of articulation are the *soft* and *hard breathings*, the *spiritus lenis* and *spiritus asper* of the *Latin* grammarians. If the lips be opened ever so little, the breath suffered gently to pass through them, and the feeblest utterance attempted, a sound is formed of so simple a nature, that, when lengthened, it continues nearly the same, except that, by the least acuteness in the voice, it becomes a cry, and is probably the first sound uttered by infants: but if, while this element is articulated,



articulated, the breath be forced with an effort through the lips, we form an *aspirate*, more or less harsh in proportion to the force exerted. When, in pronouncing the simple vowel, we open our lips wider, we express a sound completely articulated, which most nations have agreed to place the *first* in their symbolical systems: by opening them wider still, with the corners of them a little drawn back, we give birth to the *second* of the *Roman* vowels; and by a large aperture, with a farther inflexion of the lips, and a higher elevation of the tongue, we utter the *third* of them. By pursing up our lips in the least degree, we convert the simple element into another sound, of the same nature with the *first* vowel, and easily confounded with it in a broad pronunciation: when this new sound is lengthened, it approaches very nearly to the *fourth* vowel, which we form by a bolder and stronger rotundity of the mouth: a farther contraction of it produces the *fifth* vowel, which, in its elongation, almost closes the lips, a small passage only being left for the breath. These are all short vowels: and if an *Italian* were to read the words *an innocent bull*, he would give the sound of each corresponding long vowel, as in the monosyllables of his own language, *fà, fì, fò, fe, fù*. Between these ten vowels are numberless gradations, and nice inflexions, which use only can teach; and, by the composition of them all, might be formed an hundred diphthongs, and a thousand triphthongs; many of which are found in *Italian*, and were probably articulated by the *Greeks*; but we have only occasion in this tract for two diphthongs, which are compounded of the *first* vowel with the *third*, and with the *fifth*, and should be expressed by their constituent letters. As to those vocal compounds which begin with the *third* and *fifth* short vowels, they are generally, and not inconveniently, rendered by distinct characters, which are improperly arranged among the consonants. The tongue, which assists in forming some of the vowels, is the principal instrument in articulating two liquid sounds, which have something of a local nature: one  
by

by striking the roots of the upper teeth, while the breath passes gently through the lips; another, by an inflexion upwards, with a tremulous motion; and these two liquids coalesce with such ease, that a mixed letter, used in some languages, may be formed by the first of them followed by the second. When the breath is obstructed by the pressure of the tongue, and forced between the teeth on each side of it, a liquid is formed peculiar to the *British* dialect of the *Celtick*.

We may now consider in the same order, beginning with the root of the tongue, and ending with the perfect close of the lips, those less musical sounds, which require the aid of a *vowel*, or at least of the *simple breathing*, to be fully articulated: and it may here be premised, that the *harsh breathing* distinctly pronounced after each of these *consonants*, as they are named by grammarians, constitutes its proper *aspirate*.

By the assistance of the tongue and the palate, are produced two congenial sounds, differing only as *hard* and *soft*; and these two may be formed still deeper in the throat, so as to imitate, with a long vowel after them, the voice of a raven: but if, while they are uttered, the breath be harshly protruded, two analogous articulations are heard, the second of which seems to characterize the pronunciation of the *Arabs*; while the *nasal* sound, very common among the *Persians* and *Indians*, may be considered as the *soft palatine*, with part of the breath passing through the nose; which organ would by itself rather produce a *vocal* sound, common also in *Arabia*, and not unlike the cry of a young antelope, and some other quadrupeds.

Next come different classes of *dentals*; and among the first of them should be placed the *sibilants*, which most nations express by an *indented* figure. Each of  
the



the *dental* sounds is hard or soft, sharp or obtuse; and by thrusting the tip of the tongue between the teeth, we form two sounds exceedingly common in *Arabick* and *English*, but changed into lisping sibilants by the *Persians* and *French*; while they, on the other hand, have a sound unknown to the *Arabs*, and uncommon in our language, though it occurs in some words, by the composition of the hard sibilant with our last vowel pronounced as a diphthong. The liquid *nasal* follows these, being formed by the tongue and roots of the teeth, with a little assistance from the other organ: and we must particularly remember, when we attend to the pronunciation of *Indian* dialects, that most sounds of this class are varied in a singular manner by turning the tongue upwards, and almost bending it back towards the palate, so as to exclude them nearly from the order, but not from the analogy, of dentals.

The *labials* form the last series, most of which are pronounced by the appulse of the lips on each other, or on the teeth, and one of them by their perfect close. The letters by which they are denoted, represent, in most alphabets, the curvature of one lip, or of both: and a *natural character* for all articulate sounds might easily be agreed on, if nations would agree on any thing generally beneficial, by delineating the several organs of speech in the act of articulation, and selecting from each a distinct and elegant outline. A perfect language would be that in which every idea capable of entering the human mind, might be neatly and emphatically expressed by one specifick word; simple, if the idea were simple; complex, if complex: and on the same principle, a perfect system of letters ought to contain one specifick symbol for every sound used in pronouncing the language to which they belonged. In this respect the old *Persian*, or *Zend*, approaches to perfection: but the *Arabian* alphabet, which all *Mohammedan* nations have inconsiderately adopted, appears to me so complete for the purpose of writing *Arabick*, that not a letter  
could





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ऌ ॡ ए ऐ ओ औ अं अः

क का कि की कु कू कृ कृ

कृ कृ के कै को कौ कं कः

ख ख ग घ ङ च छ ज झ ञ

ट ठ ड ढ ण त थ द ध न

प फ ब भ म य र ल व श

ष स ह क्ष श

could be added, or taken away, without manifest inconvenience; and the same may indubitably be said of the *Dévanágari* system; which, as it is more naturally arranged than any other, shall here be the standard of my particular observations on *Asiatick* letters. Our *English* alphabet and orthography are disgracefully, and almost ridiculously, imperfect; and it would be impossible to express either *Indian*, *Persian* or *Arabian* words in *Roman* characters, as we are absurdly taught to pronounce them: but a mixture of new characters would be inconvenient; and, by the help of the diacritical marks used by the *French*, with a few of those adopted in our own treatises on *fluxions*, we may apply our present alphabet so happily to the notations of all *Asiatick* languages, as to equal the *Dévanágari* itself in precision and clearness; and so regularly, that any one, who knew the original letters, might rapidly and unerringly transpose into them all the proper names, appellatives, or cited passages, occurring in tracts of *Asiatick* literature.



This is the simplest element of articulation, or first *vocal* sound, concerning which enough has been said. The word *America* begins and ends with it; and its proper symbol therefore is A; though it may be often very conveniently expressed by E, for reasons which I shall presently offer. In our own anomalous language, we commonly mark this elementary sound by our *fifth* vowel, but sometimes express it by a strange variety both of vowels and diphthongs; as in the phrase, *a mother bird flutters over her young*; an irregularity which no regard to the derivation of words, or to blind custom, can in any degree justify. The *Nágari* letter is called *Acàr*; but it is pronounced in *Bengal* like our *fourth*,  
short



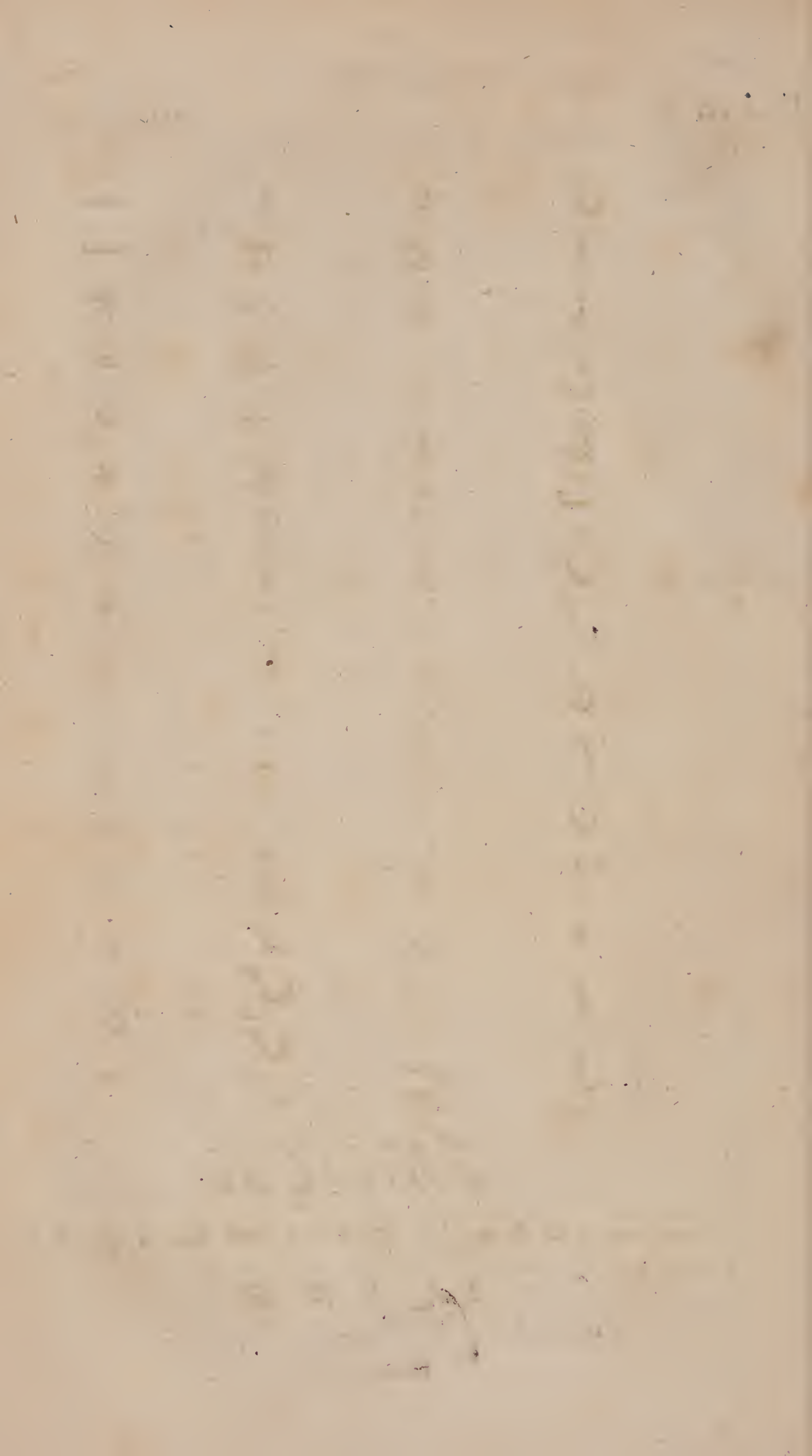
short vowel ; and in the *west* of *India* like our *first*. In all the dialects properly *Indian*, it is considered as *inherent* in every consonant ; and is placed last in the system of the *Tibetians*, because the letters which include it are first explained in their schools. If our double consonants were invariably connected, as in *Sanscrit*, it would certainly be the better way to omit the simple element, except when it begins a word. This letter answers to the *fat-hhah*, or *open* sound of the *Arabs*, and, in some few words, to the *Zeber* of the *Persians*, or an acute placed *above* the letters : but this *Arabian* mark, which was supplied in the *Pahlavi* by a distinct character, is more frequently pronounced at *Isfahân*, either like our *first* or our *second* short vowel, as in *chashm* and *ferzend* ; and the distinction seems to depend, in general, on the nature of the consonant which follows it. Two of our letters, therefore, are necessary for the complete notation of the *acâr* and *zeber* ; and thus we may be able occasionally to avoid ridiculous or offensive equivocations in writing oriental words, and to preserve the true pronunciation of the *Persians*, which differs as widely from that of the *Muslimans* in *India*, as the language of our court at *St. James's* differs from that of the rusticks in the *Gentle Shepherd*.

अ

When the *first* vowel, as the *Persians* pronounce it in the word *bakht*, is doubled, or prolonged, as in *bákht*, it has the sound of the second *Nágarì* vowel, and of the first *Arabick* letter, that is, of our long vowel in *cast* ; but the *Arabs* deride the *Persians* for their broad pronunciation of this letter, which in *Iràn* has always the sound of our vowel in *call*, and is often so prolated, as to resemble the *fourth*, and even the *fifth*, of our long vowels. Its natural mark would be the short A *doubled* : but an *acute* accent in the middle of words, or a *grave* at the end of them, will be equally clear, and conform-  
1
able







able to the practice of polished nations on the continent of *Europe*. The very broad sound of the *Arabian* letter, which they call *extended*, and which the *Persians* extend yet more, as in the word *ásàn*, may aptly enough be represented by the prosodial sign, since it is constantly long; whereas the mark *hamzhah* as constantly *shortens* the letter, and gives it the sound of the point above or below it, as in the words *ósùl* and *Islàm*. The changes of this letter may perplex the learned, but his perplexity will soon vanish as he advances. In writing *Asiatick* names, we frequently confound the broad *à* with its correspondent short vowel, which we improperly express by an *O*: thus we write *Cossim* for *Kásim*, in defiance of analogy and correctness. Our vowel in *fond* occurs but seldom, if ever, in *Arabian*, *Indian*, or *Persian* words. It is placed, nevertheless, in the general system, with the short prosodial mark, and stands at the head of the vowels, because it is, in truth, only a variation of the simple breathing.



Our *third* vowel, correctly pronounced, appears next in the *Nágarì* system; for our *second* short vowel has no place in it. This vocal sound is represented in *Arabick* by an acute accent *under* the letter, which at *Mecca* has almost invariably the same pronunciation; but since in the *Zend* a character like the *Greek Epsilon* represents both our *second* and *third* short vowels, the *Persians* often pronounce *zìr* like *zeber*, calling this country *Hend*, and the natives of it *Hendùs*: nevertheless, it will be proper to denote the *Sanscrit icàr*, and the *Arabian casr*, by one unaltered symbol, as in the words *Indra* and *Imám*.



The *third* vowel produced or lengthened, is, for the reason before suggested, best marked by an accent, either acute or grave, as in *Italian*:

Se



Se cerca, se dice :  
 L'amico dov'è ?  
 L'amico infelice,  
 Rispondi, morì !  
 Ah ! no ; sì gran duolo ,  
 Non darle per me.  
 Rispondi, ma solo :  
 Piangendo partì.

It was once my practice to represent this long vowel by two marks, as in the words *Lebeid* and *Deiwàn*, to denote the *point* in *Arabick* as well as the letter above it ; but my present opinion is, that *Lebìd* and *Dìwàn* are more conformable to analogy, and to the *Italian* orthography, which, of all *European* systems, approaches nearest to perfection.

### 3

This is our *fifth* vowel ; for our *fourth* short one is, like our *second*, rejected from the pure pronunciation of the *Sanscrit* in the *west* of *India*, and at *Bánáras* ; though the *Bengalese* retain it in the first *Nágarì* letter, which they call *ocàr*. To the notation of this sound, our vowel in *full*, and the *Persian* in *gul*, should be constantly appropriated, since it is a simple articulation, and cannot, without impropriety, be represented by a double letter. It answers to *hu-psilon*, and, like that, is often confounded with *iota*. Thus *mushe* has the sound of *mishc* among the modern *Persians* ; as *Numpha* was pronounced *Nympha* by the *Romans*. The *damm* of the *Arabs* is, however, frequently sounded, especially in *Persia*, like our short *O* in *memory* ; and the choice of two marks for a variable sound is not improper in itself, and will sometimes be found very convenient.

The same lengthened, and properly expressed by an accent, as in the word *virtù*: it is a very long vowel in *Persian*, so as nearly to treble the quantity of its correspondent short one; and this, indeed, may be observed of all the long vowels in the genuine *Isfaháni* pronunciation; but the letter *váu* is often redundant, so as not to alter the sound of the short vowel preceding it; as in *khósh* and *khód*: it may, nevertheless, be right to express that letter by an accent.

A vocal sound peculiar to the *Sanscrit* language: it is formed by a gentle vibration of the tongue preceding our *third* vowel pronounced *very short*, and may be well expressed by the prosodial mark, as in *Rīshi*, a Saint. When it is connected with a consonant, as in *Chrīshna*, no part of it is used but the curve at the bottom. We have a similar sound in the word *merrily*, the second syllable of which is much shorter than the first syllable of *riches*.

The same complex sound considerably lengthened; and, therefore, distinguishable by the prosodial sign of a *long* vowel.





In *Bengal*, where the *ra* is often sunk in the pronunciation of compound syllables, this letter expresses both syllables of our word *lily* : but its genuine sound, I believe, is *lrī*, a short triphthong, peculiar to the *San-scrit* language.



Whatever be the true pronunciation of the former symbol, this is only an elongation of it, and may, therefore, be distinguished by the metrical sign of a long vowel.



Our *second* long vowel, best represented, like the others, by an accent, as in *Véda*, the sacred book of the *Hindus*, which is a derivative from the *San-scrit* root *vid*, to *know*. The notation which I recommend will have this important advantage, that learned foreigners in *Europe*, will in general pronounce the oriental words expressed by it, with as much correctness and facility as our own nation.



This is a diphthong, composed of our *first* and *third* vowels, and expressible, therefore, by them, as in the word *Vaidya*, derived from *Véda*, and meaning *a man of the medical cast* in *Bengal*. It is pronounced as the *Greek* diphthong in *poimèn*, a *shepherd*, was probably founded

founded in ancient *Greece*. The *Arabs* and the *English* articulate this composition exactly alike; though we are pleased to express it by a simple letter, which on the continent of *Europe* has its genuine sound. In the mouth of an *Italian*, the constituent vowels in the words *mai* and *miei* do not perfectly coalesce, and at the close of a verse, they are separated; but a *Frenchman* and a *Persian* would pronounce them nearly like the preceding long vowel; as in the word *Mai*, which at Paris means our month of the same name, and at *Isfahàn* signifies wine. The *Persian* word, indeed, might with great propriety be written *mei*, as the diphthong seems rather to be composed of our *second* and *third* short vowels; a composition very common in *Italian* poetry.

## 3

Though a coalition of *acàr* and *ucàr* forms this sound in *Sanfrit*, as in the mystical word *óm*, yet it is, in fact, a simple articulation, and the *fourth* of our long vowels.

## 3

Here, indeed, we meet with a proper diphthong, compounded of our *first* and *fifth* vowels; and in *Persia* the constituent sounds are not perfectly united; as in the word *Firdausi*, which an Italian would pronounce exactly like a native of *Isfahàn*. Perhaps, in *Arabick* words, it may be proper to represent by an accent, the letters *yà* and *wáw*, which, preceded by the *open* vowel, form the respective diphthongs in *Zohàir* and *Faúheri*: but the omission of this accent would occasion little inconvenience.



अ०

This is no vowel, but an abbreviation, at the end of a syllable, of the *nasal* consonants: thus the *Portuguese* write *Siaó* for *Siam* with a nasal termination: and the accurate M. D'ANVILLE expresses great unwillingness to write *Siam* for the country, and *Siamois* for the people of it, yet acknowledges his fear of innovating, ' notwithstanding his attachment to the original and proper ' denominations of countries and places.' It appears to me, that the addition of a distinct letter, *ga*, would be an improper and inconvenient mode of expressing the nasal sound, and that we cannot do better than adopt the *Indian* method of distinguishing it, in *Sanscrit*, *Chinefe*, and *Persian* words, by a point above the letter; as in *Sinha*, a lion; *Cánhi*, the name of an illustrious Emperor; and *Sámán*, a household.

अः

This too is an abbreviation or substitute, at the close of a syllable, for the *strong aspirate*, and may be distinguished in the middle of a word by a hyphen, as in *duh-c'ha*, pain; though it seems often to resemble the *Arabian* *hà*, which gives only a more forcible sound to the vowel which precedes it, as in *hhiemah*, science. It is well known, that, when such *Arabick* words are used in construction, the *final* aspirate of the first noun has the sound of *tà*; but, as the letter remains unaltered, it should, I think, be preserved in our characters, and expressed either by two *points* above it, as in *Arabick*, or by an accentual mark; since, if we write *Zubdahu'lmulc*, or, *the Flower of the Realm*, with a comma to denote the suppression of the *álif*, every learner will know, that the first word should be pronounced

nounced *Zubdat*. The *hà* is often omitted by us, when we write *Persian* in *English* letters, but ought invariably to be inserted, as in *Sháhnámah*; since the aspiration is very perceptibly founded in the true pronunciation of *dergáh*, *rúbáh*, and other similar words. The *Sanscrit* character before us has the singular property of being interchangeable, by certain rules, both with *ra* and *sa*; in the same manner as the *Sylva* of the *Romans* was formed from the *Æolick* word *hylva*, and as *arbo*s was used in old *Latin* for *arbor*.



We come now to the first proper consonant of the *Indian* system, in which a series of letters, formed in the throat near the root of the tongue, properly takes the lead. This letter has the sound of our *k* and *c* in the words *king* and *cannibal*; but there will be great convenience in expressing it uniformly by the *second* of those marks, whatever be the vowel following it. The *Arabs*, and, perhaps, all nations descended from *SEM*, have a remarkable letter founded near the palate with a hard pressure, not unlike the cawing of a raven, as in the word *Kásim*; and for this particular sound the redundancy of our own alphabet supplies us with an useful symbol. The common people in *Hhejáz* and *Egypt* confound it, indeed, with the first letter of *Gabr*; and the *Persians* only add to that letter the hard palatine sound of the *Arabian kâf*: but if we distinguish it invariably by *k*, we shall find the utility of appropriating our *c* to the notation of the *Indian* letter now before us. The third letter of the *Roman alphabet* was probably articulated like the *kappa* of the *Greeks*; and we may fairly suppose, that *Cicero* and *Cithara* were pronounced alike at *Rome* and at *Athens*. The *Welsh* apply this letter



letter uniformly to the same sound, as in *cae* and *cefn*; and a little practice will render such words as *citàb* and *cinnara* familiar to our eyes.

२

We hear much of aspirated letters; but the only proper *aspirates* (those, I mean, in which a strong breathing is distinctly heard after the consonants) are to be found in the languages of *India*; unless the word *cachexy*, which our medical writers have borrowed from the *Greek*, be thought an exception to the rule. This aspiration may be distinguished by a *comma*, as the letter before us is expressed in the word *c'hanitra*, a *spade*. The *Arabian*, *Persian*, and *Tuscan* aspirate, which is formed by a harsh protrusion of the breath, while the consonant is roughly articulated near the root of the tongue, may be written as in the word *makhzen*, a *treasury*.

३

Whatever vowel follows this letter, it should constantly be expressed as in the words *gul*, a flower, and *gil*, clay; and we may observe, as before, that a little use will reconcile us to this deviation from our irregular system. The *Germans*, whose pronunciation appears to be more consistent than our own, would scarce understand the *Latin* name of their own country, if an *Englishman* were to pronounce it as he was taught at school.

४

The proper aspirate of the last letter, as in the word *Rag'huvanfa*. The *Persians* and *Arabs* pronounce their *ghain* with a bur in the throat, and a tremulous motion  
of

of the tongue, which gives it a sound resembling that of *r*, as it is pronounced in *Northumberland*: but it is, in truth, a compound guttural, though frequently expressed by a simple letter, as in *Gaza*, which should be written *Ghazzah*, a city of *Palestine*; and in *gazelle*, as the *French* naturalists call the *ghazâl*, or antelope, of the *Arabians*. The *Persian* word *migh*, a cloud, is *még'ha* in *San scrit*; as *mísh*, a sheep, appears also to be derived from *més'ha*, by that change of the long vowels which generally distinguishes the *Iranian* from the *Indian* pronunciation.

## 3

This is the *nasal* palatine, which I have already proposed to denote by a *point* above the letter *n*; since the addition of a *g* would create confusion, and often suggest the idea of a different syllable. Thus ends the first series of *Nágārì* letters, consisting of the *hard* and *soft* guttural, each attended by its proper aspirate, and followed by a *nasal* of the same class; which elegant arrangement is continued, as far as possible, through the *San scrit* system, and seems conformable to the beautiful analogy of nature.

## Ṭ

The next is a series of *compound* letters, as most grammarians consider them, though some hold them to be simple sounds, articulated near the palate. The first of them has no distinct sign in our own alphabet, but is expressed, as in the word *Chína*, by two letters, which are certainly not its component principles. It might, perhaps, be more properly denoted, as it is in the great work of M. D'HERBELOT, by *tsh*; but the inconvenience of retaining our own symbol will be less than that of introducing a new combination, or inventing, after the example of Dr. FRANKLIN, a new character.

*Chína*



*Chína* is a *Sanſcrit* word ; and it will be convenient ſo to write it, though I feel an inclination to expreſs it otherwiſe.

८

The ſame compoſition, with a ſtrong breathing articulated after it. Harſh as it may ſeem, we cannot, if we continue the former ſymbol, avoid expreſſing this ſound, as in the word *ch'handas*, metre.

५

This too ſeems to have been conſidered by the *Hindus* as a ſimple palatine, but appears, in truth, to be the complex expreſſion of *dz**h*. Perhaps the ſame letter may, by a ſmall difference of articulation, partake of two different ſounds. This, at leaſt, we may obſerve, that the letter under conſideration is confounded, as a ſimple ſound, with *ja* ; and, as a compound, with *za*, one of its conſtituents: thus the *yáſmín* of *Arabia* is by us called *jaſmin* ; while the ſame man is *Giorgi* at *Rome*, and *Zorzi* at *Venice* ; or (to give an example of both in a ſingle word) *yug*, or *junction*, at *Bánáres*, is *jug* in *Bengal* ; and was pronounced *zug*, or, in the nominative, *zugon*, at *Athens*. We ſhould, however, invariably expreſs the letter before us by *ja*.

The *Arabian* letters *dhàl'*, *dàd*, and *dhà*, are all pronounced in *Persia* like *za*, with a ſort of liſp, from an attempt to give them their genuine ſound: They may be well expreſſed as in fluxionary characters, by a ſeries of points above them, *ẏ*, *ẏ̇*, *ẏ̈*.

२

The preceding letter aspirated, as in the word *Ḥ' hasha*, a fish.

३

This is the *second* nasal, composed of the former and the letter *ya*. As the *Italian* word *agnello* and our *onion* contain a composition of *n* and *y*, they should regularly be written *anyello* and *onyon*; and the *Indian* sound differs only in the greater nasality of the first letter, which may be distinguished, as before, by a *point*. A very useful *Sanscrit* root, signifying *to know*, begins with the letter *ja*, followed by this compound *nasal*, and should be written *jnyà*; whence *jnyāna*, knowledge: but this harsh combination is in *Bengal* softened into *gyà*: it is expressed by a distinct character, which stands last in the plate annexed.\*

४

In the curious work entitled *Toḥfahū'l Hind*, or, *The Present of INDIA*, this is the *fourth* series of *Sanscrit* letters; but, in general, it has the *third* rank, more agreeably, I think, to the analogy of the system. This class is pronounced with an inflexion of the tongue towards the roof of the mouth, which gives an obtuse sound to the consonant, and may be distinguished by an accent above it. The first is the *INDIAN* *ṭa*, as in the word *cōṭara*, a rotten tree, and is commonly expressed in *Persian* writings by *four* points, but would be better marked by the *ARABIAN* *ṭà*, which it very nearly resembles.

The

\* Plate II.



ठ

The same with a strong breathing after it, as in *Vaicunt'ha*, or *unwearied*, an epithet of *Vishnu*.

ड

A remarkable letter, which the *Muslimans* call the INDIAN *dāl*; and express, also, by four points over it: but it should, by analogy to the others, be distinguished by an accentual mark, as in the word *danāda*, punishment. When the tongue is inverted with a slight vibratory motion, this letter has a mixture of the *ra*, with which it is often, but incorrectly, confounded; as in the common word *bera* for *beḍa*, great. It resembles the ARABIAN *dād*.

ढ

The preceding letter aspirated, as in *D'hācà*, improperly pronounced *Dacca*. In the same manner may be written the ARABIAN *dhā*, but without the comma, since its aspirate is less distinctly heard than in the *Indian* sound.

ण

This is the *nasal* of the third series, and formed by a similar inversion of the tongue. In *Sanſcrit* words it usually follows the letters *ra* and *sha*, (as in *Bráhmeṇa*, derived from *Brahmañ*, the Supreme Being; *Vishṇu*, a  
name

name of his *preserving* power,) or precedes the other letters of the third class.

उ

Here begins the *fourth* series, on which we have little more to remark. The first letter of this class is the common *ta*, or *hard* dental, if it may not rather be considered as a *lingual*.

ट

Its aspirate, which ought to be written with a comma, as in the word *Afwatt'ha*, the *Indian* fig-tree, lest it be confounded by our countrymen with the *Arabian* sound in *thurayyà*, the *Pleiads*, which is precisely the *English* aspiration in *think*; a sound which the *Persians* and *French* cannot easily articulate. In *Persian* it should be expressed by *s* with a point above it.

द

The *soft* dental in *Dévatà*, or *Deity*.

ध

The same aspirated, as in *D'herma*, justice, virtue, or piety. We must also distinguish this letter by a comma from the *Arabian* in *dhahab*, gold; a sound of difficult articulation in *France* and *Persia*, which we write *thus* very improperly, instead of retaining the genuine *Anglo-Saxon* letter; or expressing it, as we might with great convenience, *dhus*.

The



न

The simple *nasal*, sounded by the teeth with a little assistance from the nostrils, but not so much as in many *French* and *Persian* words. Both this *nasal* and the former occur in the name *Náráyēṇa*, or *dwelling in water*.

प

Next come the *labials* in the same order; and first the hard labial *pa*, formed by a strong compression of the lips, which so ill suits the configuration of an *Arabian* mouth, that it cannot be articulated by an *Arab* without much effort.

फ

The proper aspirate of *pa*, as in the word *shepherd*; but often pronounced like our *fa*, as in *fela*, instead of *p'hela*, fruit. In truth, the *fa* is a distinct letter; and our *pha*, which in *English* is redundant, should be appropriated to the notation of this *Indian* labial.

ब

The *soft* labial in *Budd'ha*, wife, and the second letter in most alphabets used by *Europeans*; which begin with a vowel, a labial, a palatine, and a lingual. It ought ever to be distinguished in *Nágarì* by a transverse bar, though the copyists often omit this useful distinction.

उ

The *Indian* aspirate of the preceding letter, as in the word *bhášhá*, or a *spoken* dialect. No comma is necessary in this notation, since the sound of *bha* cannot be confounded with any in our own language.

य

This is the last nasal, as in *Menu*, one of the first created beings according to the *Indians*: it is formed by closing the lips entirely, whilst the breath passes gently through the nose. And here ends the regular arrangement of the *Nágarì* letters. Another series might have been added, namely, *śa*, *śha*, *za*, *zha*, which are in the same proportion as *ta*, *tha*, *da*, *dha*, and the rest; but the two last sounds are not used in *Sanscrit*.

य

Then follows a set of letters approaching to the nature of vowels. The first of them seems, in truth, to be no more than our *third* short vowel beginning a diphthong, and may, therefore, be thought a superfluous character. Since this union, however, produces a kind of consonant articulated near the palate, it is ranked by many among the consonants, and often confounded with *ja*: hence *Yamunà*, a sacred river in *India*, called also the *Daughter of the Sun*, is written *Jomanes* by the *Greeks*, and *Jumnà*, less properly, by the *English*.

The



व

The two liquids *na* and *ma*, one of which is a lingual, and the other a labial, are kept apart, in order to preserve the analogy of the system; and the other two are introduced between the two semi-vowels: the first of these is *ra*, as in *RA'MA*, the conqueror of *Silàn*.

ल

The second is *la* in *Lañca*, another name of that island both in *Tibut*, and in *India*. A defect in the organs of the common *Bengalese* often causes a confusion between these two liquids, and even the sound of *na* is frequently substituted for the letter before us.

व

When this character corresponds, as it sometimes does in *Sanscrit*, with our *wa*, it is, in fact, our *fifth short* vowel preceding another in forming a diphthong, and might easily be spared in our system of letters; but when it has the sound of *va*, it is a labial, formed by striking the lower lip against the upper teeth, and might thus be arranged in a series of proportionals, *pa, fa, ba, va*. It cannot easily be pronounced in this manner by the inhabitants of *Bengal*, and some other provinces, who confound it with *ba*, from which it ought carefully to be distinguished; since we cannot conceive that, in so perfect a system as the *Sanscrit*, there could ever have been two symbols for the same sound. In fact, the *Montes Parveti* of our ancient Geographers were so named from *Parveta*, not *Parbeta*, a mountain. The *wáw* of the *Arabs* is always a vowel, either separate or coalescing  
with

with another in the form of a diphthong ; but in *Persian* words it is a consonant, and pronounced like our *va*, though with rather less force.



Then follow three *sibilants*, the first of which is often, very inaccurately, confounded with the second, and even with the third: it belongs to that class of consonants which, in the notation here proposed, are expressed by acute accents above them, to denote an inversion of the tongue towards the palate, whence this letter is called in *India* the *palatine sa*. It occurs in a great number of words, and should be written as in *palá'sa*, the name of a sacred tree, with a very brilliant flower. In the same manner may be noted the *śad* of the *Arabs* and *Hebrews*, which last it resembles in shape, and probably resembled in sound; except that in *Cásmír*, and the provinces bordering on *Persia*, it is hardly distinguishable from the following letter.



The *second* is improperly written *sha* in our *English* system, and *cha*, still more erroneously, in that of the *French*; but the form generally known may be retained, to avoid the inconvenience of too great a change even from wrong to right. This letter, of which *sa* and *ha* are not the component parts, is formed so far back in the head, that the *Indians* call it a *cerebral*. Either it was not articulated by the *Greeks*, or they chose to express it by their *Xi*; since of the *Persian* word *Ardashìr* they have formed *Artaxerxes*.



The dental *sa*, which resembles the *Hebrew* letter of the same sound, and, like that, is often mistaken by ignorant copyists for the *ma*.

The



ह

The strong breathing *ha*, but rather misplaced in the *Nágarì* system, since it is the second element of articulate sounds. The *very* hard breathing of the *Arabs* may be well expressed by doubling the mark of aspiration, as in *Muhhammed*; or by an accent above it, in the manner of the long vowels, as in *Ahmed*.

फ

The *Indian* system of letters closes with a compound of *ca* and *sha*, as in the word *parícshà*, ordeal: it is analogous to our *x*, a superfluous character, of no use, that I know of, except in algebra. The *Bengalese* give it the sound of *cya*, or of our *k* in such words as *kind* and *sky*: but we may conclude, that the other pronunciation is very ancient, since the old *Persians* appear to have borrowed their word *Racshah* from the *Racsha*, or *demon* of the *Hindus*, which is written with the letter before us. The *Greeks* rendered this letter by their *Khi*, changing *Dacshin*, or the south, into *Dakhin*.

All the sounds used in *Sanfrit*, *Arabick*, *Persian*, and *Hindì*, are arranged systematically in the table prefixed to this dissertation;\* and the singular letter of the *Arabs*, which they call *áin*, is placed immediately before the consonants. It might have been classed, as the modern *Jews* pronounce it, among the strong *nasals* of the *Indians*; but, in *Arabia* and *Persia*, it has a very different sound, of which no verbal description can give an idea, and may not improperly be called a *nasal vowel*: it is uniformly distinguished by a *circumflex* either above a short vowel, or over the letter preceding a long one, as *ilm*, learning; *áálim*, learned.

\* Plate I.





अहमेवासमेवाग्रे नान्यद्यत् सदसत् परम्  
पञ्चादहं यदेतच्च योवशिष्येत सोऽस्म्यहम्

ऋतेर्थं यत् प्रतीयेत न प्रतीयेत चात्मनि  
तद्विद्यादात्मनो मायां यथा भासो यथात्मः

यथा मदांति भूतानि भूतेषूच्चावचे धनु  
प्रविष्टान्यप्रविष्टानि तथा तेषु न तेषहं

एतावदेव जिज्ञास्य तत्त्व जिज्ञासुनात्मनः

अन्वयव्यतिरेकाभ्यां यत् स्यात् सवन्न सर्वदा

Agreeably to the preceding analyfis of letters, if I were to adopt a new mode of *English* orthography, I should write *Addifon's* description of the angel in the following manner, distinguishing the *simple breathing*, or first element, which we cannot invariably omit, by a perpendicular line over our first or second vowel.

Sò hwen sm énjel, bai divain cãmánd,  
 Widh raifin tempefts fhécs a gilti land,  
 Sch az äv lét ór pél Británya pást,  
 Cálm and firín hi draivz dhi fyúryas bláft,  
 And, plíz'd dh' ālmaitiz ārderz tu perfórm,  
 Raids in dhi hwerlwind, and dairects dhi stārm.

This mode of writing poetry would be the touchstone of bad rhymes, which the eye, as well as the ear, would instantly detect; as in the first couplet of this description, and even in the last, according to the common pronunciation of the word *perform*. I close this paper with specimens of oriental writing; not as fixed standards of orthography, which no individual has a right to settle, but as examples of the method which I recommend; and, in order to relieve the dryness of the subject, I annex translations of all but the first specimen, which I reserve for another occasion.

## I.

*Four Distichs from the SRI' BHA'GAWAT.\**

Mr. WILKINS's Orthography.

āhāmēvāsāmēvāgrē nānyādyāt sādāsāt pārām  
 pāsčādahām yādētāchchā yōvāsēēshyētā sōsmyāhām

\* See Plate IV. The Letters are in Plate II.



rēetēthām yāt prātēēyētā nā prātēēyētā chātmanēē  
tādvēēdyād ātmānō māyām yāthā bhāsō yāthā tāmah

yāthā māhāntēē bhōōtānēē bhōōtēshōōchchāvāchēshwā-  
prāvēēshtānyāprāvēēshtānēē tāthā tēshōō nātēshwāhām [nōō

ētāvadēvā jēējnāsyām tattwā jēējnāsōōnātmanāh  
ānwāyā vyātēērēkābhyām yāt syāt sārvaṭrā sārvaḍā.

This wonderful passage I should express in the follow-  
ing manner :

ahamēvāsamēvāgrē nānyadyat sadasat param  
pāschādaham yadētachcha yōvaśishyēta sōsmyaham

rītērt'ham yat pratīyēta na pratīyēta chātmani  
tadvidyādātmanō māyām yat'hā bhāsō yat'hā tamah

yat'hā mahānti bhūtāni bhūtēshūchchāvachēshwanu  
pravishṭānyapravishṭāni tat'hā tēshu na tēshwaham

ētāvadēva jījnyāsyam tattwa jījnyāsūnātmanah  
anwaya vyatirēcābhyām yat syāt servatra servaḍā.

## II.

### MO'HA MUDGARA.

The title of this fine piece properly signifies, *The Mallet of Delusion* or *Folly* ; but may likewise be translated, *A Remedy for Distraction of Mind* : it is com-  
posed

posed in regular anapæstic verses, according to the strictest rules of *Greek* prosody, but in rhymed couplets, two of which here form a *śloca*.

মূঢ়জহীহিধনাগমতৃষ্ণা° নরতনুবৃষ্টিমনঃ সূবিতৃষ্ণা° ।  
যল্লভসেনিজকর্মোপাত্ত° বিত্ত° তেনবিনোদয়চিত্ত° ॥

কাতবকাতাকন্তেপুত্রঃ স° সাংঘোষমতীববিচিত্রঃ ।  
কদ্যত্ব° বানতত্মাযাতুত্ব° চিত্তযতদিদ° ভ্রাতঃ ॥  
মানবধ্বনজনযৌবনগর্ব° হস্ততিনিমেষাৎকালঃ সর্ব° ।  
মায়াময়মিদমথিল° হিত্বাব্রূপদ° পুৰিশাশ্চবিদিত্বা ॥

নলিনীদেলগতজলবতবন° উদ্ভজীবনমতিশয়চপল° ।  
ক্ষণমিহসঙ্কুলস° গতিবেকাভবতিভবান্নবতবগেনৌকা ॥  
যাবজ্জান° ভাবনম্বা° ভাবজ্জানীজ্ঞেবেশয়ন° ।  
ইতিস° সাংঘেস্ফটকদোষঃ কথমিহমানবতবসগোষঃ ॥

দিনযামিন্যোদায়° প্রাতঃ শিশিৰবসন্তোপূনৰামাতঃ ।  
কালঃ ক্রীড়তিগচ্ছত্ৰায়ুদ্ভদ্রপিনমুঞ্চত্যাশাবায়ুঃ ॥  
অঙ্গ° গলিত° পলিত° মুণ্ড° দত্তবিহীন° জাত° তৃত° ।  
কবধূতকল্লিতশোভিতদন্ত° উদপিনমুঞ্চত্যাশাভাণ্ড° ॥



সুৰবৰযাদ্ৰিৰতকতলবাসঃ শয্যাভূতলমাজিন° বাসঃ ।  
সৰ্বপৰিগ্ৰহভোগত্ৰাণঃ কস্যস্মৃৎ° নকৰোতিবিৰাগঃ ॥

শত্ৰৌমিত্ৰেপুত্ৰেবনৌমানবগত্ব° বিগ্ৰহসন্তো ।

ভবসমচিত্তঃ সৰ্বত্ৰ° বাঙ্কস্যচিৰাঙ্গদ্যবিষ্কৃত্ব° ॥

অষ্টকুলাচলসপ্তসমুদ্রাবক্ষপূৰন্দৰদিনকৰবদ্রাঃ ।

নত্ব° নাহ° নাম° নোকমুদপিকিমর্থ° ত্ৰিযতোশোকঃ ॥

ত্ৰয়িমিচান্যত্ৰৈকোবিষ্কুব্যর্থ° নপ্যসিমস্যসহিষ্ণুঃ ।

সৰ্ব° পশ্যঅন্যাঅান° সৰ্বত্ৰোৎসৃজভেদজ্ঞান° ॥

বালস্তাবৎক্ৰীড়াশত্ৰুস্তব্গস্তাবৎকনীবৃত্তঃ ।

বৃষ্টিস্তাবৎচিত্তামগ্নঃ পৰমেব্রহ্মণিকোপিনলগ্নঃ ॥

দ্বাদশপঞ্চটিকাভিৰাশেষঃ শিষ্যাণা° কথিতোভ্যুপদেশঃ ।

যেষা° নৈষবৰোতিবিবেক° তেষা° কঃ কৃতাযতিবেক°

múḍha jahíhi dhanágamatrīshñám  
curu tenubuddñimanah suvitṛīshnám  
yallabhasè nijacarmópáttam  
vittam téna vinódaya chittam.

cá tava cántá castè putrah  
saṁscároyam atíavichittrah  
casya twam vâ cutà áyáta  
stattwam chintaya tadidam bhrátah.

má curu dhanajanayauvanagarvam  
 harati niméshát calah sarvam  
 máyámayamidamac'hilam hitwà  
 brehmapadam prevísásu veditwà.

nalínídalagatajalavattararam  
 tadvajjīvanamatisaya chapalam  
 cshenamiha sajjana saṅgatiṛēcà  
 bhawati bhawāṛnavataranè naucà.

angam galitam palitam muṇḍam  
 dantavihiham jātam tuṇḍam  
 caradhrītacampitaśóbbhitadaṇḍam  
 tadapi namuṇchatyáśa bhāṇḍam.

yāvajjananam távanmaraṇam  
 távajjananì jātharè śayanam  
 iti sansāṛè sp'huṭatara dóshah  
 cat'hamiha mánava tava śāntośhah.

dinayāminyau sáyam prātah  
 śísiravasantau punaráyātah  
 cālah criḍati gach'hatyāyu  
 stadapi na muṇchatyáśāvāyuh.

suravaramaṇdiratarutalavāsah  
 śayyà bhūṭalamajinam vásah  
 servaparigrahabhógatyāgah  
 casya suc'ham na caróti virāgah.



śatrau mitrè putrè baṇdhau  
 mà curu yatnam vighrahasaṇdhau  
 bhava samachittah servatra twam  
 vāñch'hasyachirād yadi viśhnutwam

ashtāculāchalaseptasamúdrā  
 brehmapuraṇdaradinacararudrāh  
 natwam nāyam nayam lóca  
 stadapi cimart'ham criyatè sócah.

twayi mayi chānyatraicò vishnur  
 vyart'ham cupyasi mayyasahishnuh  
 servam paśyātmānyātmānam  
 servatrótsrija bhédajñyānam

vālastāvat crídāśaṣṭa  
 staruṇastāvat tarúniraṣṭah  
 vriddhastāvach chintāmagnah  
 peremé brahmañi cópi nalagnah.

dwādaśa pajj'haticābhiraśéshah  
 śishyānam cat'hitóbhyupadésah  
 yéshām naisha caróti vivécam  
 téshām cah curutāmatirécam.

#### A verbal Translation:

1. Refrain, deluded *mortal*, thy thirst of acquiring wealth; excite an aversion *from it* in *thy body*, understanding, and inclination: with the riches which  
 thou

thou acquirest by thy own actions, with these gratify thy soul.

2. Who *is* thy wife; who thy son? How extremely wonderful is even this world! Whose *creature* thou also *art*; whence thou camest. Meditate on this, O brother, *and again* on this.

3. Make no boast of opulence, attendants, youth; all *these* time snatches away in the twinkling of an eye: checking all this illusion like *Mâyâ*, set thy heart on the foot of BRAHME, speedily gaining knowledge of him.

4. As a drop of water moves tremulous on the lotus-leaf, thus *is* human life inexpressibly slippery: the company of the virtuous *endures* here but for a moment; that is our ship in passing the ocean of the world.

5. The body *is* tottering; the head, grey; the mouth, toothless: the delicate staff trembles in the hand which holds it: still the flaggon of covetousness remains unemptied.

6. How soon *are we* born! how soon dead! how long lying in the mother's womb! How great is the prevalence of vice in this world! Wherefore, O man, hast thou complacency here below?

7. Day and night, evening and morning, winter and spring, depart and return: time sports, life passes on; yet the wind of expectation continues unrestrained.

8. To dwell under the mansion of the high gods at the foot of a tree, to have the ground for a couch, and a hide for vesture, to renounce all extrinſick enjoyments; whom doth not such devotion fill with delight?

9. Place



9. Place not thy affections too strongly on foe or friend, on a son or a kinsman, in war or in peace : be thou even-minded towards all, if thou desirest speedily to attain the nature of VISHNU.

10. Eight original mountains, and seven seas, BRAHME, INDRA, the SUN, and RUDRA, *these are permanent* : not thou, not I, nor this or that people : wherefore then should anxiety be raised *in our minds* ?

11. In thee, in me, in every other being, is VISHNU : foolishly art thou offended with me, not bearing my approach : see every soul in thy own soul ; in all places lay aside a notion of diversity.

12. The boy so long delights in his play, the youth so long pursues his damsel, the old man so long broods over uneasiness, *that* no one meditates on the Supreme Being.

13. This is the instruction of learners delivered in twelve distinct stanzas : what more can be done with such, as this work fills not with devotion ?

### III.

The following Elegy, which is chosen as a specimen of *Arabick*,\* was composed by a learned Philosopher and Scholar, M'IR MUHAMMED HUSAIN, before his journey to *Haidarâbâd* with RICHARD JOHNSON, Esq.

*mâ ânsa lâ ânsa âllatî  
jâat îlayya âlai hadhar  
âlnaûmu âthkala jafnahâ  
waâlkalbu târa bihi âldkaâr*

*ra'sadat*

\* Plate III. and Plate V.

## هذه الأبيات بحمد حسين

جَاءَتْ بِتِ الْبُكْرِ حَسَنًا  
 وَالْقَلْبُ طَارَ بِهِ الدُّعَا  
 فَمَجَلَسَتْ مِنْهَا الْعُزْرَةَ  
 الْأَنْفَاقَ مَا سَمِعَتْ  
 وَقَدَّتْ بِهَا كَهْمَ لَحْوٍ  
 لَسَادٍ حَصْرَ الْعَمْرِ  
 وَكَانَ الْحَزَنُ مَكَانِ اشْكُرْ  
 عَلَى طَلْعِ نَفْسِ التَّرْمِزِ  
 مَحْمَدًا لِمَا إِلَيْكَ الْعَكْرِ  
 الْأَمْسَاحُ فِي حَوَاكِيهِ  
 حَذَّرَتْ غَمَّافِي مِنْ حَقْنِ  
 وَسُكْنِ دِيَارِ الْبَلَدِ الْكَلْبِ  
 وَمَرَمَتْ قَوَادِي السُّكْرِ  
 أَنْ تَدُلِّي حَيَاةَ الْعَمْرِ  
 وَادُوكَ حَرَمَ الْعَفْرِ  
 وَطَرَعَ مَا صَحَاءُ الْعَدْرِ  
 أَوْ رَدَّكَ تَرْوِي الْمَقْرِ  
 وَبَارَكَ تَرْوِي سَكْرِ  
 حَوْلًا لِيَدُ سَوِي السَّحْرِ  
 وَسَلَّتْ أَرَامَ الشَّكْرِ  
 بِأَوْجَحِ طَلْعِ الْبَكْرِ  
 وَأَمَّا السَّادُ وَمَا قَبْلَهُ

مَا أَلَسْنَ لَا أَنْسَ الَّتِي  
 الْبُكْرُ أَثْقَلَ حَقْنَهَا  
 رَصَدَتْ أَسَادَ دَقْمَهَا  
 تَرْوِي حَلَا حَلَا  
 تَشْكُو الطَّرِيقَ لَطَمَهَا  
 فِي لَبْلَبَةٍ مَدَّ كَمَلَتْ  
 وَتَرَى الْقَمَامَ كَأَحْمَلِ  
 تَبْكِي عُمُونَ السَّمَا  
 وَالْأَرْقُ يَلْسَمُ تَقَرُّ  
 وَالرَّجُلُ كَمَا كَمَلَتْ  
 فَبُوتَ تَحَا لَقْنَهُ وَفَدِ  
 وَاللَّحْمُ مَلَّ حَلْدُودَهَا  
 وَتَقَسَّتْ إِذْ كَلَمَتْ  
 طَلَّتْ تَحَابِي عَلَى  
 قَالَتْ أَدْبَتْ قَوَادِيهَا  
 بَصْرًا أَوَامِرَ الْهَوَى  
 وَتَلَّ وَرَمْنِ أَمْرِ إِلَى  
 أَيْوَمًا تَسِيرُ بِلَا السَّمَانِ  
 مَا ذَا أَلْفَاذُكَ حَوْلَهَا  
 أَلْفَتْ أَطْيَاءَ الْفَلَا  
 لَمْ تَقْدِ مَلَّتْ حَوَارِنَا  
 فَأَرْحَمَ عَلَى قَلْبِ الدَّعَا





*raśadat āsāwida kaūmihā  
fatakhallasat minhā ālgharar  
nazaāt khalākhilān lehā  
āllā tufājíhnā bishar.*

*teshcú āltarika liđhulmahin  
fakadat bihā najma ālsahhar  
fí laílahin kad cahhalat  
bisawādhā jafna ālkamar*

*wa terai ālghamāma caājmulin  
terāi ālnujūma ālai āshar  
tebcí ūyūnoñ lilsemāi  
ālai hadáyikihā ālzuhar*

*waálberku yebsimu thegruhu  
ājabān lihática ālghiyar  
waálrádu cáda yukharriku  
ālāsmákha fí summi ālkajar*

*fahawat tuāánikuní wakad  
hadharat ínákí min khafar  
waáldemū bella khudúdahā  
wasakai riyadān lilnađhar*

*wateneffasat idh callamat  
waramat fuwādí biálsherar  
đhallat tuāátibunéi ālai  
án jedda lí āzmu ālsafar*



*kálat ádhakta fuwádaná  
waádhaktahu kerra álsakar  
taáší áwámera lilhawái  
watutíúu náshaca álghudar*

*watedúru min árđín ilái  
árđín wamá terđái álmekarr  
yaúmán tesíru bica álbihháru  
watárahán turmaí bibarr*

*má dhá áfádaca jaúlahon  
kaúla álbiládi siwai áldajar  
aálifta ádhbáa álfelá  
wanesíta árâma álbásher*

*ám kad melelta jiwáraná  
yá wáika khillín kad nafar  
fárhem álai kalbí álladhí  
ráma álfuluwwa wamá kadar.*

### The Translation.

1. Never, oh ! never shall I forget the fair one, who came to my *tent* with timid circumspection :

2. Sleep sat heavy on her eye-lids, and her heart fluttered with fear.

3. She had marked the dragons of her tribe, (the *sentinels*,) and had dismissed all dread of danger from them :

4. She

4. She had laid aside the rings which used to grace her ankles, lest the sound of them should expose her to calamity ;

5. She deplored the darkness of the way, which hid from her the morning-star.

6. It was a night, when the eye-lashes of the moon were tinged with the black powder (*alcohol*) of the gloom ;

7. *A night*, in which thou mightest have seen the clouds, like camels, eagerly gazing on the stars ;

8. While the eyes of heaven wept on the bright borders of the sky ;

9. The lightning displayed his shining teeth, with wonder at this change *in the firmament* ;

10. And the thunder almost burst the ears of the deafened rocks.

11. She was desirous of embracing me, but, through modesty, declined my embrace.

12. Tears bedewed her cheeks, and to my eyes, watered a bower of roses.

13. When she spake, her panting sighs blew flames into my heart.

14. She



14. She continued expostulating with me on my excessive desire of travel.

15. ‘Thou hast melted my heart, (she said,) and made it feel inexpressible anguish.

16. ‘Thou art perverse in thy conduct to her who loves thee, and obsequious to thy guileful adviser.

17. ‘Thou goest round from country to country, and art never pleased with a fixed residence.

18. ‘One while the seas roll with thee; and another while, thou art agitated on the shore.

19. ‘What fruit, but painful fatigue, can arise from rambling over foreign regions?

20. ‘Hast thou associated thyself with the wild antelopes of the desert, and forgotten the tame deer?

21. ‘Art thou weary then of our neighbourhood? O woe to him who flees from his beloved!

22. ‘Have pity at length on my afflicted heart, which seeks relief, and cannot obtain it.’

Each couplet of the original consists of two *Dimeter Iambicks*, and must be read in the proper cadence.







## IV.

As a specimen of the old *Persian* language and character, I subjoin a very curious passage from the *Zend*, which was communicated to me by BAHMAN, the son of BAHRA'M, a native of *Yezd*, and, as his name indicates, a *Parsi*: he wrote the passage from memory, since his books in *Pahlavi* and *Deri* are not yet brought to *Bengal*. It is a supposed answer of I'ZAD, or GOD, to ZERA'HTUSHT, who had asked by what means mankind could obtain happiness.

*Az pid u mād che ce pid u mād ne khošnūd bīd har-  
giz bihišt ne vīnīd ; be jāyi cirfah bizah vīnīd : mehār  
rā be āzarm nīc dārīd, cehān rā be hīch gūnah mayāz-  
ārīd : aj khīshāvendī dervīsh nang medārīd : dād u  
vendād ī khālīki yectā beh cār dārīd ; az ristākhī zi ten  
pāsīn endī sheh nemāyīd : mābādā ce ašhū ten khī sh  
rā dūzakhī cunīd, va ānche be khī sh ten nashāhad be  
casān mapasendīd va ma cunīd : herche be gitī cunīd be  
mainū az aūeh pazīrah āyed.\**

## A verbal Translation.

“ If you do that with which your father and mother are not pleased, you shall never see heaven ; instead of good-spirits, you shall see evil beings. Behave with honesty and with respect to the great ; and on no account injure the mean : hold not your poor relations a reproach to you : imitate the justice and goodness of the Only Creator : meditate on the resurrection of the future body, lest you make your souls and bodies the inhabitants of hell ; and whatever would be displeasing to yourselves, think not that pleasing to others, and do it not : whatever good you do on earth, for that you shall receive a retribution in heaven.”

\* Plate VII. The *Zend* Letters are in Plate III.



It will, perhaps, be suspected (and the language itself may confirm the suspicion) that this doctrine has been taken from a religion very different, both in age and authority, from that of ZERA'HTUSHT.

## V.

The following story in modern *Persian*, was given to me by Mirzà ABDU'LRAHHÍ'M, of *Isfahàn*: it seems extracted from one of the many poems on the loves of MEJNU'N and LAIL'I, the ROMEO and JULIET of the East. Each verse consists of a *Cretick* foot, followed by two *Choriambi*, or a *Choriambus* and a *Moloffus*.

شیرمست سرپستان الم	پرورش یافته دامن غم
آبرنگ درخ لیلیای جنون	خال رخساره هامون مجنون
یافت چون راه بکاشانه عشق	آستان شد درخاته عشق
بر سرش شخص جنون سایه فکند	قصه عاشقیش کشت باند
در عرب هر طرفی غوغا شد	نقل او نقل مجالس باشد
بد امیری بعرب والا شان	صاحب مکنّت و ثروت بجهان
ترکت از غم مجبران دیده	پر کل داغ محبت چیده
دیده در طغلی خود سوز فراق	تلخی زهر فراقش بمذاق

یافت چون قصه آن درد سهکال کرد فرمان بنعلامی در حال

که سوی نجر قدم ساز ز سر شوبه تعجیل روان چون صرص  
آگاه دلبرده ز مجنون بنگاه به برم زود بسیار همراه

رفت و آورد غلامک در حال لیلی آن پادشاه ملک جمال  
بنعلامی دگرش شد فرمان که تو هم شوبه سوی دشت روان

جانب زینت ارباب جنون شمع پر نور محبت مجنون  
زود آور برم آن سوخته را آن جگر سوز غم اندوخته را

رفت و برگشت غلامک چون نگاه والی کشور عشقش همراه  
کرد او را چون نظر مرد امیر دید زاری بغم عشق اسیر

بر سرش مشخص جنون کرده وطن زخم هجران به تنش پیراهن  
موی سر بر بدنش کشته قبا موزه از آبله پابر پا

شانه از خار مخیالان بر موش خرقة از یک بیابان بر دوش  
گفت کای کم شده وادی نیم هیچ خواهی که تمنّات دهم  
سر فرازت کنم از مکنّت و جاه لبی آرم بیزت خاطر خواه



گفت نني نني که بعيد است بعيد      ذره را ام نظري باخو رشيد  
گفت خواهي که کنسي راست بگو      سير آن صفحه رخسارنگو  
بلنداري بجماش مياي      راست برکوي بجان يلي  
گفت کاي قدوه ارباب کرم      ذره خاک درت تاج سرم  
بر دلم درد زلياي کافي است      خواهش وصل زبي الصافيت  
بهر خور سندي اين جزو حقير      بس بود برتوي از مهر منير  
گفت و کرديد سوي دشت روان      دیده کريان و مره اشک نشان

*Shírmasti seri pistáni álem  
perveresh yáftehi dámeni ghem*

*ābi rang ò rokhi lailāyi jonùn  
kháli rokhsárehi hámún Mejnún*

*yáft chún rāh bi cáshánehi íshk  
āsitán shud bideri khánehi íshk*

*ber serezh shakh'si jonùn fáyah ficand  
kis'sehi ááshikì ásh gasht boland*

*der árab her íarafi ghaughà shud  
nakli ú nokli mejális-hà shud*

*búd ámiri biârab vâlâ shân  
 shakibi micnat ò servat \* bijehân*

*torc tázi ghemî hejrân didah  
 pur guli dághi mohabbat chidah*

*didah der tifliyi khód súzi ferák  
 talkhiyi zahri ferákesh bimezák*

*yáft chun kíssehi ân derd signál  
 card fermân bighulâmi der hál*

*ceh súyi najd kadam fáz zi fer  
 shau beh tájíl ravân chûn shersher*

*ân ceh dil bordah zi Mejnûn bi nigâh  
 beh berem zúd biyáver hemráh*

*raft ò âvard ghulâmac der hál  
 Laílî ân pádishahi mulci jemál*

*beh ghulâmi digaresh shud fermân  
 ceh tò hem shau bi súyi dasht ravân*

*jánibi zínati árbâbi jonûn  
 shemî pur núri mohabbat Mejnûn*

\* The reader will supply the point over s, when it stands for th.



zùd āver berem ān fúkhtah rà  
 ān jigarsùzi ghem āndúkhtah rà

raft ò bergasht ghulāmac chū nigáh  
 váliyi cishvari íshkesht hemráh

card úrà chū nažar mardi ámir  
 díd zārì bi ghemì íshk ásir

ber feresht shakhši jonùn cardah važen  
 zakhmi hejràn bi tenesh píráhen

múyi fer ber bedenesht gashtah kobà  
 múzah áz ābilahi pá ber pà

shānah áz khāri mughílān ber mūsh  
 khirkah áz rigi biyábān ber dúsh

goft cāi gomshudahi vádiyi ghem  
 híh khwáhì ceh temennát dehem

ferferázat cunam áz micnat ó jáh  
 Laílì ārem biberet kháter khwáh

goft nì nì ceh baiídest baiíd  
 že reh rā hém nazarì bà khorshíd

goft khwáhì ceh conì rást bigú  
 saíri ān šafkahi rokhsári nicú

*yâ nedâri bijemâlesh maîlî  
râst bergúyi bi jáni Laîlî*

*goft cáî kodvahi árbâbi cerem  
žerrahi khâci deret táji serem*

*ber dilem derd zi Laîlî cáfist  
khwáheshti vaśl zi bî ínśáfist*

*bahri khorfendiyi ín jozvi ĥakír  
bas buvad pertavî áz mihri monír*

*goft ò gardîd súyî dasht ravân  
dídah giryân ò mizhah áshcfishân*

### The Translation.

1. *The man who had inebriated himself with milk from the nipple of Anguish, who had been nourished in the lap of Affliction,*

2. MEJNU'N, mad with the bright hue and fair face of LAILI', himself a dark mole on the cheek of the desert,

3. Having found the way to the mansion of Love, became *fixed* like the threshold on the door of Love's palace.

4. Over his head the form of Madness had cast her shadow : the tale of his passion was loudly celebrated.



5. Among the *Arabs* a tumult arose on all sides: the relation of his adventures was a deffert in their assemblies.

6. A powerful Prince reigned in *Arabia*, possessing worldly magnificence and riches:

7. He had seen the depredations of Grief through absence from a beloved object: he had plucked many a black-spotted flower from *the garden of Love*.

8. Even in his infancy he had felt the pain of separation: the bitter taste of that poison remained on his palate.

9. When he learned the story of that afflicted lover, he instantly gave an order to a slave,

10. *Saying*, ‘Make thy head like thy feet in running towards *Najd*: go with celerity, like a violent wind.

11. ‘Bring speedily with thee to my presence, Her who has stolen the heart of MEJNU’N with a glance.’

12. The stripling ran, and in a short time brought LAILI, that Empress in the dominion of beauty.

13. To another slave *the Prince* gave this order: ‘Run thou also into the desert:

14. ‘Go to that ornament of frantic lovers, MEJNU’N, the illumined taper of love,

15. ‘Bring

15. 'Bring quickly before me that inflamed youth,  
' that heart-consumed, anguish-pierced lover.'

16. The boy went, and returned, in the twinkling of an eye, accompanied by the ruler in the territories of Love.

17. When the Prince looked at him, he beheld a wretch in bondage to the misery of desire.

18. Madness had fixed her abode on his head: he was clothed, as with a vest, with the wounds of separation.

19. His locks flowed, like a mantle, over his body: his only sandal was the callus of his feet.

20. In his hair stuck a comb of *Arabian* thorns: a robe of sand from the desert covered his back.

21. 'O thou, (said *the Prince*,) who hast been lost in  
' the valley of sorrow, do thou not wish me to give  
' thee the object of thy passion,

22. 'To exalt thee with dignity and power, to bring  
' LAILI before thee, gratifying thy soul?'

23. 'No, no, (answered he :) far, far is it from my  
' wish that an atom should be seen together with the sun.'

24. 'Speak truly, (replied the Prince :) art thou not  
' willing to recreate thyself on the smooth plain of that  
' beautiful cheek ?



25. ‘ Or hast thou no inclination to enjoy her charms?  
‘ I adjure thee, by the soul of LAILI, to declare the  
‘ truth !’

26. He rejoined : ‘ O chief of men with generous  
‘ hearts, a particle of dust from thy gate is a diadem on  
‘ my head.

27. ‘ The pain of my love for LAILI is sufficient for  
‘ my heart: a wish to enjoy her presence *thus* would be  
‘ injustice.

28. ‘ To gratify this contemptible soul of mine, a  
‘ single ray from that bright luminary would be enough.’

29. He spake, and ran towards the desert, his eye  
weeping, and his eye-lashes raining tears.

These couplets would fully answer the purpose of showing the method in which *Persian* may be written according to the original characters, with some regard also to the *Isfahânè* pronunciation ; but since a very ingenious artist, named MUHAMMED GHAUT’H, has engraved a tetrastich on copper, as a specimen of his art, and since no moveable types can equal the beauty of *Persian* writing, I annex his plate\*, and add the four lines, which he has selected, in *English* letters : they are too easy to require a translation, and too insignificant to deserve it.

*Huwa’l âzîz*

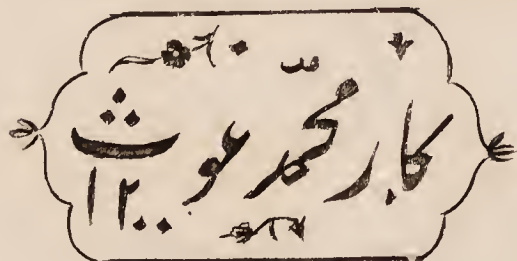
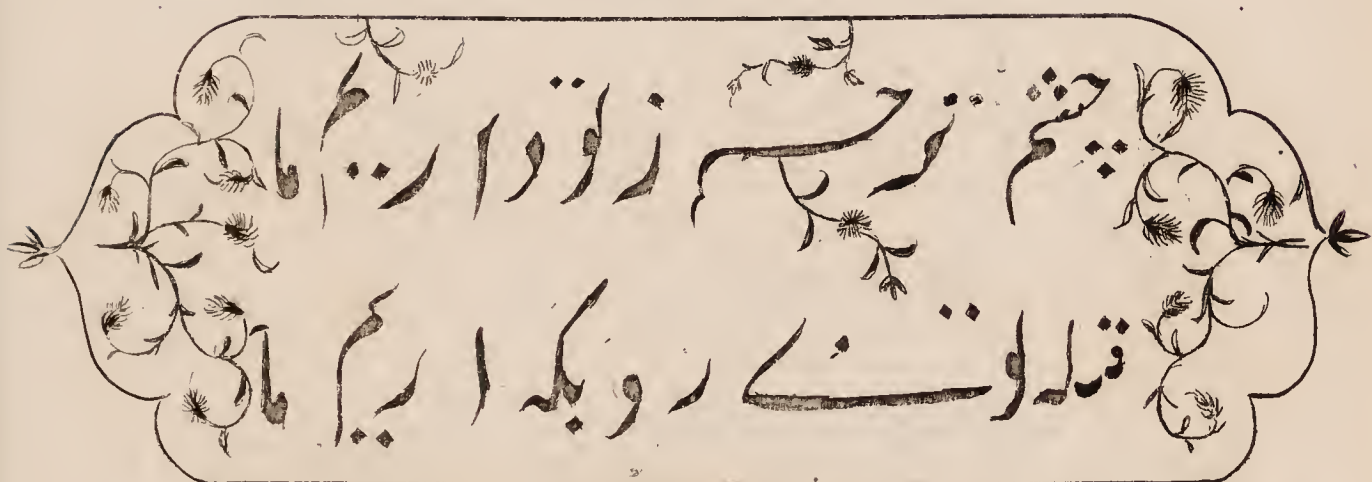
*Chashmi terakhum zi tô dârîm mâ*

*keblah-tôyi-rû beceh ârîm mâ*

*kâjati mâ âz tò bèr âyed temâm*

*dâmenat âz caf naguzârîm mâ.*

\* Plate VI.







## VI.

THE first specimen of *Hindî*, that occurs to me, is a little *Ghazâl*, or love-song, in a *Choriambick* measure, written by GUNNA' BEIGUM, the wife of GHA'ZIU'LDI'N KHA'N, a man of consummate abilities and consummate wickedness, who has borne an active part in the modern transactions of Upper *Hindústân*.

مردعي همسي سخن ساز بالوسي هي  
 اب تمنا كو يهان مرده باوسي هي  
 اه اب كثر داغ غم خوبالسي تمام  
 صحنه سينه ميراجاوه طاوسي هي  
 هي ميري طرح جگر خون تيرا مدت سبي  
 اي حنا كسكي تجهي خواهش باوسي هي  
 عوض درد مزي سي وه بهري بين ساري  
 جس لب زخم ني شمشير تيري چوسي هي  
 تهمت عشق عبث كر تي اين مجهر منت  
 نان يسه سچ مانسي كي خوان سي توتك خوسي هي

*Muddaîi hemsè sokhan sâz bi sâlûsî hai*  
*ab tamennâ cò yehân muzhdeî mâyûsî hai*  
*âh ab casrati dâghi ghemi khûbân sè temân*  
*şafhaî sînâh mērâ jilwâî taûsî hai*



*hai mèrì tarakh jigar khúni térà muddatsè  
 ài hinnà ciscì tujhè khwáhishi pábúsì hai*

*âwâzi derd mezè sè wah bherè haiñ sârè  
 jis lebi zakhm nè shemshîrî térî chúsì hai.*

*tohmati îshk âbas cartè haiñ mujhper Minnat  
 hân yeh sech milnè cì khúbân sè tù tuc khúsì hai.*

### The Translation.

1. My beloved foe speaks of me with dissimulation; and now the tidings of despair are brought hither to the desire of my soul.

2. Alas! that the smooth surface of my bosom, through the marks of burning in the sad absence of lovely youths, is become like the plumage of a peacock.

3. Like me, O *Hinnà*, (the fragrant and elegant shrub, with the leaves of which the nails of *Arabian* women are dyed crimson,) thy heart has long been full of blood: whose foot art thou desirous of kissing?

4. Instead of pain, *my beloved*, every wound from thy cimeter sucks with its lips the sweetnesss with which it is filled.

5. The suspicion of love is vainly cast on MINNAT—Yes, true it is, that my nature rather leads me to the company of beautiful youths.

Thus have I explained, by observations and examples, my method of noting in *Roman* letters, the principal languages of *Asia*; nor can I doubt that *Armenian*, *Turkish*, and the various dialects of *Tartary*, may be expressed in the same manner with equal advantage: but, as *Chinese* words are not written in alphabetical characters, it is obvious that they must be noted according to the best *pronunciation* used in *China*; which has, I imagine, few sounds incapable of being rendered by the symbols used in this essay.

## II. ASTRONOMICAL

## II.

## ASTRONOMICAL OBSERVATIONS

IN

FORT WILLIAM,

AND BETWEEN

MADRAS AND CALCUTTA.

BY COLONEL THOMAS D. PEARSE,

*Commandant of the Artillery, and Second in Command  
of the Bengal Army.*

I BEG leave to communicate to the Society some  
Astronomical Observations which I made at different  
times in *Fort William*.

The clock I used from December, 1775, was made  
by ELLICOT: It beats dead seconds: there is one hand  
for minutes, and the hours revolve with the plate fixed  
to the hour-wheel.

The pendulum can be lengthened without stopping  
the clock, by means of a screw, which supports the  
spring by which the pendulum hangs. And the pendu-  
lum is described in the 47th volume of the Philosophi-  
cal Transactions, p. 479. The clock-case is firmly  
screwed to the wall. The transit instrument was made  
by Sisson; it is four feet long, and has a double ob-  
ject glafs. This is supported by two iron bars, which  
are joined to a square frame, that lies two feet under  
the floor, buried in brick-work.

The upright bars are protected by a case of wood,  
which is fixed to the house, without touching them in  
any part.

At first I used the cornice of the Commandant's  
house to adjust by; but afterwards a slider, with a slit, in  
place,



place, behind which I could place a light to adjust with by night. There was another object also to the south, about 1500 yards off, which I could use by day; and both these were fixed when the transits by telescope and equal altitudes agreed, and were examined from time to time.

I had only a tolerably good HADLEY'S quadrant and quicksilver, till December, 1776, when I was lucky enough to get an 18 inch land quadrant, made by RAMSDEN, with a micrometer to subdivide the nonius. This inverts, and is capable of the nicest adjustments. My first telescope was an 18 inch reflector, made by GREGORY.

In August, 1777, I obtained Mr. SMITH'S refractor, made by DOLLOND, with a triple object glass, and a double object glass micrometer. And I made a polar axis for it of brass with rack-work, and a declination circle not divided, which is also racked; to which, when the micrometer was used, the telescope was fixed.

I likewise communicate observations made by myself chiefly, and by Lieutenant COLEBROOKE for me, to ascertain the longitudes and latitudes of places between *Madras* and *Calcutta*.

Going to *Madras* in 1782, I used a HADLEY'S octant and quicksilver, which I shall here describe.

The octant had a wooden index. I separated the part which carries the speculum from the arm; then fixed it into a lath, and turned it on its own center: it was three tenths of an inch thick; the thickness was divided into three parts, and then the edge was turned away on each side; so that the whole piece of wood became like three wheels of different diameters joined together on  
2 their

their flat surfaces, and the middle one was the biggest ; that below was the next in size ; and the upper one was the least, and only equal to the brass plate on which the speculum was screwed.

A plate of brass, nearly one tenth thick, broad enough to admit of a hole as big as the under circular part of the turned wood, and to afford a rim of half an inch broad, was then fixed into the lath, and had a hole turned in it of that size : on one side it had an arm as broad as the wooden index was.

A second plate of the same kind was also prepared ; but the hole was larger, though less than the middle part of the turned wood.

The turned piece was then fixed to the octant by its pin, and the plate with the smaller hole beneath it. As they fitted very nicely, the brass plate turned upon the wood round the center of the octant, if that were held fast ; and both turned on the center pin if they were pressed together.

The plate with the large hole was then laid above the turned wood, its center coinciding with the common center : the wooden arm of the index had the end nearest the center cut away, above and below, equal to the thickness of the plates of brass : it was there fixed to the octant in the same manner as before it was cut off from the center, and the brass plates were drilled, and rivetted to it.

When these plates were pressed together, they held the turned piece as it were in a vice ; when they were forced asunder, the turned piece might be moved independently ; and there were in the direction of the  
radius



radius two screws, one beyond the speculum, and one between it and the nonius, for the purpose : they had button heads, and their shanks were as high as the top of the index speculum.

On the back of the octant there was a screw with a button head ; the thread entered the center pin, and the shoulder pressed upon the plate which keeps that pin in its place.

The back screw and vice screws being slacked, the index speculum was brought parallel to the horizon glass ; then the vice screws were turned to join the speculum to the index, as before the alteration was made.

To extend the power of the octant occasionally, it was nicely adjusted : then the index was carried to  $90^{\circ}$ , and there screwed to the limb. Next the back screw of the center pin was forced, till by its pressure the speculum was held fast : after that, the vice screws being slacked, the index was carried back to  $0^{\circ}$ , and there screwed to the limb. Whilst it was in this position, the vice screws were again turned, which fixed the speculum-piece to the index, and then the back screw being slacked, the speculum followed its motions. When it was used, the index shewed the angle which was to be added to  $90^{\circ}$  for the angular distance.

By this contrivance, with an octant, I could take angles of  $150^{\circ}$  ; and consequently meridian altitudes as far as  $75^{\circ}$  : and if the horizon glass and telescope could have been made to slide nearer towards the center, it would have increased still further.

In RAMSDEN's new quadrant there is a screw to adjust the horizon glass, and bring it parallel to the other : provided the index speculum is perpendicular to the limb, this is all well ; but if that be inclined, as soon as the index quits  $0^{\circ}$ , there will be an error in the angles observed.

observed. I found it so experimentally, and corrected my quadrants accordingly, by turning the horizon glass round its own axis; then having adjusted as usual, the error sideways was corrected by moving both glasses, by means of their adjusting screws, and dividing the error between them. If, when the horizon glass was restored to its proper position, there still was a lateral error, the operation was repeated. I do not find any mention of this in any of the instructions for using HADLEY's instruments that I have seen.

The horizon was artificial, invented for the occasion, and consisted of a wooden trough about  $\frac{1}{2}$  an inch deep, (or rather more,) filled nearly with quicksilver, which served to float a plate of thick glass, the under surface of which had been unpolished, and blacked, that only one image might appear. This needs not any adjustment: the only requisite is, that the glass be equally thick all over, and smooth: that which was used was a part of a very large looking-glass, that had been broken by accident.

The watch was a time-keeper, by BROOKBANK, which goes whilst it is wound up, and is tolerably good, considered as a sale watch sent to *India*.

The telescope had a double object glass, with a brass stand, and was made by GREGORY: it magnifies 80 times; but, like all of this construction, that I have seen, it had a dark speck in the middle, and was not equally good in the whole field.

In the way back, we had a land quadrant, of 15 inches radius, made by B. MARTIN, and sent out by the *India* Company. It was used by Mr. HURST in the transit of *Venus*. This could not be inverted. But, to destroy the effects of collimation, and error of level, the latitudes are all determined by stars taken north and south of each place, as the observations will shew.

T. D. PEARSE.



## JUPITER'S FIRST SATELLITE. IMMERSIONS.

Date.	Apparent Time. <i>correct.</i>	Time by <i>Ephemeris.</i>	Longitude.	
	H. M. S.	H. M. S.	H. M. S.	
1774, 14th Oct.	12.32.25	6.39.00	5.53.25	<i>Jupiter very nearly vertical, and the glass shook much.</i>
23d do.	8.57.15	3.03.17	5.53.58	
1776, 13th Nov.	13.58.56,3	8.04.46	5.54.10,3	
29th.	12.09.39	6.15.53	5.53.46	
6th Dec.	14.00.32,6	8.06.38	5.53.54,6	
13th.	15.50.59,3	9.57.02	5.53.57,3	
15th.	10.18.31	4.24.35	5.53.56	
22d.	12.08.47,6	6.14.50	5.53.57,6	
31st.	8.26.54,1	2.32.49	5.54.05,1	
1777, 16th Jan.	8.51.19,6	2.57.11	5.54.08,6	
27th Dec.	9.38.58,8	3.45.01	5.53.57,8	<i>Dollond's triple object glass.</i>

### EMERSIONS.

1774, 29th Dec.	11.25.47	5.31.52	5.53.45	<i>Dollond's triple object glass.</i>
1777, 30th Jan.	12.36.11,8	6.42.30	5.53.41,8	
1778, 15th March	8.40.49,6	2.47.41	5.53.08,6	
7th April	9.00.02,2	3.07.00	5.53.02,2	
14th.	10.56.35,1	5.03.30	5.53.05,1	
1779, 3d May	12.07.38,8	6.14.37	5.53.01,8	<i>Ditto.</i>
				<i>Ditto.</i>
				<i>Ditto.</i>

## SECOND SATELLITE.

### IMMERSIONS.

1776, 4th Dec.	10.53.23,5	4.58.08	5.55.21,5	
11th.	13.25.50,4	7.30.42	5.55.08,4	
18th.	15.58.21	10.03.14	5.55.07,0	
29th.	7.48.01,4	1.52.27	5.55.34,4	
1780, 11th July	9.34.17,3	3.41.33		
				<i>Emerged from behind the body 9.27.04.3, and was quite clear of the body at 9.28.55.3.</i>
				<i>Dollond's triple object glass</i>

### EMERSIONS.

1775, 29th Dec.	8.47.41,7	2.53.18	5.54.23,7	
1777, 23d Jan.	7.32.44,3	1.37.41	5.55.03,3	
29th April	7.20.34,1	1.25.43	5.54.51,1	
6th May	9.59.28,9	4.04.11	5.55.17,9	
1779, 8th May	11.45.53,5	5.52.13	5.53.40,5	
				<i>Here the tables seem to have been corrected.</i>
				<i>Dollond's triple object glass.</i>

THIRD

## THIRD SATELLITE.

Date.	Apparent Time correct.	Time by Ephemeris.		
	H. M. S.	H.M.S.		
1774, 10th Nov.	13.12.30	7.18.17	Emerfion.	
1775, 28th Jan.	7.28.58,5	1.33.45	Immerfion.	
	9.04.21	3.07.49	Emerfion.	But I thought I saw it about a minute before; however it was fo very dim that I cannot be certain.
1776, 3d Nov.	10.55.20,2	5.00.14	Emerfion.	
17th.	15.31.51,3	9.42.37	Immerfion.	
23d Dec.	11.10.33,6	5.19.58	Immerfion.	
1777, 28th Jan.	10.13.13,2	4.22.53	Emerfion.	
1778, 3d April.	9.21.24,9	3.33.12	Do.	I think I might have feen it earlier if I had expected it to emerge at a greater diftance than one Satellite appeared, which was the cafe. Dollond's triple object glafs.
1779, 2d May.	8.44.37,5	2.54.27	Immerfion.	Rather doubtful I thought I saw it, but Jupiter was fo very bright it dazzled my eyes.
	45.26,5 11.32.80,6	5.44.27	Emerfion.	

## FOURTH SATELLITE.

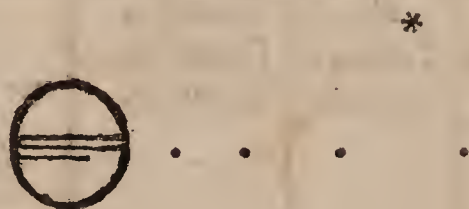
1776, 2d Nov.	13.23.14,0	Emerfion.	
1777, 8th Jan.	9.28.49,5	Immerfion.	
	25th 7.23.02,0	Emerfion.	At the time of this obfervation, there was a very fmall ftar a very little to the weft of the western- moft Satellite.
1778, 9th May.	8.25.13,0	Emerfion.	Dollond's triple object glafs.

Other



*Other Observations of Jupiter and his Satellites.*

1776, 22 November, between nine and ten, I saw a very small star, not bigger than a Satellite, very near to *Jupiter*. The configuration thus,



At 12h. 9'. 39". the configuration was thus,



that is, the two outermost Satellites had gone forward, and *Jupiter* back, in right ascension, visibly.

30th November the configuration was thus,



that is, the star was north; distant from the limb in declination about the quantity of the lesser axis. In right ascension the star was advanced further than *Jupiter's* center, about a fifth of the axis. Some time after I found that the little Satellite, which was below the limb, had immersed into the disk; and soon after I saw the shadow of that Satellite upon the Great Belt. I observed the shadow go off the disk; and about an hour after that, the Satellite emerged a little to the north of the

the Great Belt. The times were noted, but the book was destroyed by accident. When *Jupiter* passed the meridian, I could not see the star in the transit telescope; but about 4' afterwards the configuration was thus,



that is, a line drawn from the star to *Jupiter's* center, made an angle with the Great Belt, which I judged to be about  $41^\circ$ ; and in that direction it was about the quantity of the lesser axis distant from the limb; so that *Jupiter* had moved back about  $\frac{3}{4}$  of his diameter from the time I first saw him to-night till he passed the meridian.

1776, 8th December, my clock was stopped by an earthquake, which spoilt the observation of the immersion of *Jupiter's* first Satellite.

1776, 23d December, an Emerision of the first Satellite from the Disk.

*Apparent Time correct.*

The shadow touched the middle of the edge of the Great Belt, and

made a visible notch in it	-	-	h	11.26.00
It was still visible	-	-	-	28.05
It vanished	-	-	-	30.50
Satellite at the edge of the limb	-	-	-	53.25
In contact emerged	-	-	-	58.53

1777, 25th January, 7h.23'.00",6, I saw a small star a little to the west of the westernmost Satellite, not so bright



bright as either of them; it was hardly visible through the reflector.

Configuration thus,



26th, I could not find the star at 7h. 11m.

29th May, *Jupiter's* second Satellite im- h ,  
merged behind the disk - - - - 7.25.18,7

1779, 2d May, an *Immersion of Jupiter's first  
Satellite into the Disk.*

*Apparent Time correct.*

					h , "
In contact	-	-	-	-	11.31.37,6
Immersion doubtful	-	-	-	-	35.19,6
certain	-	-	-	-	35.50,6

If the immersions and emersions of this nature were calculated so as to set astronomers to look out for them, *Jupiter's* satellites might be rendered more useful than they now are in regard to longitudes by land; and that too, whether the calculations are accurate or erroneous.

For I mean to use an immersion or emersion of any kind, only to note an instant for taking the altitude of *Jupiter* at the place of observation.

If the instruments be of equal powers, and the eyes of equal strength, then certainly the altitudes will be taken

taken by every person, who shall observe the same phenomenon at one and the same instant of time; and thence the distance of *Jupiter* from the meridian of each will be known to seconds, if we suppose the latitudes known before-hand.

And if the telescopes of quadrants could be made sufficiently powerful to observe the satellites, then a single observer, at any place, could perform the whole without trouble or difficulty, and would only need a common watch, and a little more patience than would be requisite if the watch were perfect, and calculation true.

But supposing the telescopes and quadrants as they are, and two observers at each place, one employed with the satellite, and the other with the quadrant, then the latter must carefully keep the body of *Jupiter* on the line of altitude till the other tells him to stop, which is to be done at the instant of observing the expected phenomenon.

By this mode a degree of longitude may be measured with as much accuracy as a degree of latitude; and it is what I have in contemplation to perform, as soon as I can get the requisite instruments.

*Remarks on some erroneous Observations of Jupiter's first Satellite.*

In 1778, I took notice, that when *Jupiter* is very near the opposition, the observations are not to be depended on, and that the Satellite vanished without changing colour. The same happened in 1779, 1780, and again in 1784, at *Beemulwilfa*; therefore I have put down the times of such observations, as they are reduced to apparent time, from the known deviation of the clock from mean time. The transit instrument was examined



by stars that pass over the zenith, and by others north and south, and by equal altitudes; all which shewed it was as nicely in the meridian as it well could be.

In 1779, on the 3d of March, I observed  $\pi$  and  $\mu$  *Geminarum*, and the deviation was the same as that derived from the transits of the sun on the 23d February and 5th March. In the observation of the moon 23d November following, the accuracy of its position was ascertained, so that the times were correct; and the errors depend on something at the Satellite and planet. Perhaps *Jupiter's* atmosphere may be so dense as to prevent the free passage of the diminished light soon after the beginning of an eclipse, or even before it. If so, these observations may tend to clear up that point, and to measure the extent of that atmosphere.

Date.	Apparent Time correct.	Ephemeris	
	H. M. S.	H. M. S.	
1778, 4th Feb.	7.51.10,3	1.58.08	These two were observed at <i>Dumdum</i> ; but the time was taken from the transit instrument by a watch, carried out before, and back after, and compared with the clock.
1779, 23d do.	9.02.51,0	3.10.01	
2d March	10.58.15	5.05.17	
9th do.	12.53.08	7.01.07	
11th do.	7.20.35,3	1.30.10	
1780, 13th March.	10.10.47,7	4.20.23	

All these observations were made with *Dollond's* triple object glafs.

### *Observations of Venus.*

1776, 2d January, at 7h.55', in the morning, I measured the distance between *Venus* and the *Sun*  $46^{\circ} 32'$ .  
I was

I was informed the natives were viewing it with astonishment, but I did not see it with the naked eye. Through the little telescope of my HADLEY's quadrant it appeared as bright as *Capilla*.

	Apparent Time correct.
	h ' "
1777, 1st July, <i>Venus</i> passed the meridian	21.30.41,5
14th, <i>Venus</i> visible to the naked eye, and has been so three days.	
Passed the meridian - - -	21.01.02,0

*Distances from the Sun, measured with an HADLEY'S Quadrant.*

	h ' "
West limb 41° 57' - - -	21.21.58,5
East do. 42° 29' - - -	25.08,5
15th, Passed the meridian - - -	20.59.29
16th, Ditto - - -	58.08,5
17th, Still visible.	

*Distances measured as before.*

	h ' "
From nearest limb 42° 31' - -	0.08.10
From furthest do. 43° 05' - -	0.12.14

1780, 18th March, an Appulse of *Venus* to Mars.

Inch.	Non.	Distances.	Apparent Time correct.
		' "	h ' "
2,45,3	=	15.17,2	7.39.33,9
2,45,8	=	15.20,9	44.33,9
2,45,5	=	15.18,7	49.33,9

N. B. The scale of the micrometer is divided into twentieth parts of an inch, and the nonius subdivides these into twenty-five parts each.



The next morning the *Sun's* diameters were measured.

	<i>Inch.</i>		<i>Non.</i>
Horizontal	5.15	"	17,25
Vertical	5,10	"	21
<hr/>			
Mean	5,15	"	06,625
Error of micrometer		+	4
<hr/>			
	5,15	"	10,625

*Sun's* diameter by Ephemeris  $32' 11'',6$ , from which the distances were calculated.

*19th March, Difference of Declinations, and right Ascension.*

<i>Inch.</i>	<i>Non.</i>			<i>Apparent Time correct.</i>
				<i>h ' "</i>
4,20	" 00	=	26.08,7	at - - 7.41.51,4
Mars	passed the vertical wire	-	-	- - 43.09,4
Venus	do.	-	-	- - 45.16,4

*Mars* was south of *Venus*.

*Observations of Mars.*

*An Appulse of Mars to  $\alpha$  Libræ.*

<i>Distances.</i>				
<i>Inch.</i>	<i>Non.</i>			
1,00	" 19	=	6.18,5	- - 10.50.05
1,00	" 17	=	6.17,0	- - 10.58.05

The star was west of *Mars*.

*Observations of the Moon.*

*1775, 12th January, an Occultation of Aldebaran.*

Immersion	-	-	-	-	<i>h ' "</i>
					8.54.55
					I believe

I believe the watch was set by equal altitudes ; but I have lost the book in which the entry was made, and have only a copy of my observations as a register of this and the next that follows.

*15th February, an Eclipse of the Moon.*

End 10h.15'.00",5, apparent time correct.

*1776, 3d March, an Occultation of Regulus.*

Not having an ephemeris at the time, the observation was accidental, and consequently not prepared for. The transit instrument was but lately put up, and had not been much used, but it was the only resource for time: accordingly, it was adjusted truly as to level and wires, but it was not in the meridian accurately. Therefore the transits of several stars were taken to determine the position of the instrument, and the error of that being known, the times could be corrected by a very easy rule, which I subjoin. Let  $x$  be the error in seconds at the horizon,  $a$  and  $b$  the sines of the zenith distances of two stars,  $A$  and  $B$  the sines of the polar distances,  $d$  the difference of the errors of the clock, as found from the observed and the calculated transit of those two stars.

Then  $\frac{x}{A} a$  will be the space at the equator for the equation to correct one, and  $\frac{x}{B} b$  the same for the other ; and the sum of these two will be equal to  $d + 15$ . or, which is the same thing,  $\frac{x}{15 A} a + \frac{x}{15 B} b = d$ . Whence for all small angles  $x = \frac{15 + d + \frac{A B}{a B + b A}}{a B + b A}$

$\zeta$  and  $\gamma$  *Leonis* were the two stars that were relied on for time and position, because they pass so nearly at equal distances from the zenith, that the mean of their errors of the clock would be so near to the true one, that



that any clock yet invented could not shew the difference actually.

The difference of their errors was 5",6, and thence the error of the transit instrument was only 1246",16 at the horizon, and the distance of the wires of the telescope is 1478".

	<i>Times of passing the Middle Wire.</i>	<i>Equation for the Error of the Instru- ment.</i>	<i>Passage by Calcula- tion.</i>	<i>Error of Clock.</i>
3d March.				
D West Limb.	10.58.19,5	—15,08		
$\eta$ Leonis.	11.01.45.0	— 7,16	10.54.56,8	6.41,04
$\alpha$ Leonis.	03.11	—14,07	56.15,9	6.41,03
$\zeta$ The Northern.	10.33			
$\zeta$ The Southern.	10.39	+ 3,01	11.04.00,6	6.41,41
$\gamma$ The Southern.	14.04			
$\gamma$ The Northern.	14.08	— 2,59	07.24	6.41,41
$\delta$ Urfæ Majoris.	13.08.48	+92.27	13.03.43,9	6.36,37
$\epsilon$ Urfæ Majoris.	48.40	+92,01	43.34	6.38,00
Immersion,	14.02.39,5			
It was emerged, but I did not see the Emer- sion.	52.30			

6th March, *Equal Altitudes, by a HADLEY'S  
Quadrant and Quicksilver.*

Quadrant.

		<i>h</i>	
30.00	rising -	20.29.41	
	falling -	27.42.30	6.05,5
30.30	rising -	20.32.14	
	falling -	27.39.56	6.05,6
	Mean -		6.05,25
	Equation of equal altitudes -		7,10
			5.58,15

This

This compared with the error of the clock by  $\zeta$  and  $\gamma$ , shews that it was losing  $17''.06$  daily; at which rate, to the time that  $\epsilon$  Ursæ Majoris passed the meridian, it must have lost  $1''.95$ , and the error by  $\epsilon$  ought to have been  $6'.39''.4$ . The difference is only  $1''.4$ , which is not greater than the errors of observation may sometime be in stars of great declination.

*Result.**Apparent Time correct.*

		h	'	"
☾ West Limb passed the meridian	-	10.51.23		
Regulus	- - - -	-	56.15,5	
Immersion	- - - -	-	13.56.00,15	
And emerged in less than 50'.				

1776, 30th July, an Eclipse of the Moon.

Beginning of total darkness.

*Apparent Time correct.*

		h	'	"
By eye	- - - -	17	00.49	
By telescope	- - - -	-	01.16	
Clouds prevented any other observations.				

1777, 20th January, an Occultation of  $\zeta$  Geminorum by the Moon.

*Apparent Time correct.*

		h	'	"
Immersion	- - - -	13.37.38,6		

23d January, an Eclipse of the Moon.

*Apparent Time correct.*

		h	'	"
Eclipse began	- - - -	8.41.21,7		
Shadow well defined	- - - -	44.33,7		
Mare Humorum touched	- - - -	49.13,7		
Grimaldus do.	- - - -	50 43,7		

Grimaldus



					<i>Apparent Time correct.</i>
					h ' "
Grimaldus passed	-	-	-	-	53.18,7
Mare Humorum do.	-	-	-	-	53.33,7
Tycho's dark circle touched	-	-	-	-	56.13,7
Tycho's body do.	-	-	-	-	56.40,7
Copernicus do.	-	-	-	-	9.26.28,7
Do. passed	-	-	-	-	33.23,7

## Going off again.

Copernicus passed	-	-	-	-	10.12.58,5
Grimaldus do.	-	-	-	-	21.23,5
Mare Humorum touched	-	-	-	-	36.17,5
Aristeus passed	-	-	-	-	37.33,5
Mare Humorum do.	-	-	-	-	47.23,5
Regiomontanus do.	-	-	-	-	11.00.08,5
Tycho's body	-	-	-	-	02.33,5
Tycho's dark circle passed	-	-	-	-	05.38,5
Vendelin do.	-	-	-	-	12.23,5
Faint Penumbra remained	-	-	-	-	32.25,5
Limb clear. End	-	-	-	-	33.33,5
☾ West limb passed the meridian	-	-	-	-	12.03.22,7
East do. do.	-	-	-	-	05.38,2

The times are those of the shadow's edge, unless it be otherwise expressed.

1777, 13th February, an Occultation of  $\mu$  Ceti.

					<i>Apparent Time correct.</i>
					h ' "
Immersion	-	-	-	-	7.53.46,7

I was very certain of the time of the immersion. Five seconds before it the star began to change colour, and to lose light sensibly: one second before the immersion,

merfion, it was confiderably broader and redder than at firft, and the light was not fo ftrong as before.

This fupports the fuppoftion of an atmofphere round the moon, though it does not extend to any great diftance. It has been doubted, and is, I believe, not yet abfolutely admitted. But our atmofphere may be doubted by an inhabitant of the moon; for if to its greateft extent, fuppofted 45 miles, it were of the fame denfity as at the furface of the earth, which is not the cafe, it would not fubtend a minute, as the earth is 8000 miles in diameter, and the greateft parallax only 62'.

1777, 16th May, an Appulfe of the Moon to  $\gamma$  Scorpii.

Apparent Time correct.

		h	'	"
West limb paffed the meridian	-	7.59.50,	1	
$\gamma$ Scorpii do.	- - - - -	8.00.02,	1	

By the arch of the tranfit inftrument, the ftar was 10' from the limb.

1779, 1st May, an Appulfe of the Moon to Mars and Saturn.

Having brought the Moon's limb to run along a wire of declination,

Apparent Time correct.

		h	'	"
The eastern limb paffed the vertical wire		10.23.09,	5	
Saturn paffed the fame	- - -	10.23.21,	5	

Saturn did not come within the fcale of the micrometer.

For the right Afcenfions.

Apparent Time correct.

			h	'	"
Mars	}	Passed the meridian at	12.55.42		
Saturn			56.34		
Eastern limb			57.36		
			Distances		



*Distances of the Moon and Mars.*

<i>Inch.</i>	<i>Non.</i>			<i>Apparent Time correct.</i>
		<sup>h</sup>	<sup>'</sup>	<sup>"</sup>
4,70	08,5	=	28.40,3	13.18.42,5
4,65	21	=	28,31,1	26.34,5
4,65	15	=	28.26,7	{ Mean of the three times and the same measure. }
4,65	21	=	28.31,1	
4,70	05	=	28.37,7	31.53,5
				36.49,5
				41.06,5

1779, 3<sup>d</sup> May, an *Appulse* of the Moon to  $\beta$  Ophiuchi.  
*Difference of Declination.*

<i>Inch.</i>	<i>Non.</i>			<i>Apparent Time correct.</i>
		<sup>h</sup>	<sup>'</sup>	<sup>"</sup>
4,70	17	=	28.09,9	10.22.58,1

The star was to the west of the Moon's horn from which the distance was measured, because the micrometer could not take in the limb.

<i>Inch.</i>	<i>Non.</i>			<i>Apparent Time correct.</i>
		<sup>h</sup>	<sup>'</sup>	<sup>"</sup>
4,60	17	=	28.09,9	10.22.51,1

*Examination of the Micrometer.*

	<sup>h</sup>		<i>Inch.</i>	<i>Non.</i>
1 <sup>st</sup> May, 19.29.		lesser diameter of the Sun	5,2	13
		Again	-	15
		Greater diameter	-	23
		Again	-	24

Hence mean diameter 5,2 <sup>h</sup> 17,5

There are twenty-five nonius to divide one twentieth of an inch.

When the limbs coincided the zeros agreed.

The ephemeris gives 15'.54",6 for the semi-diameter, therefore one nonius is equal to 0",7294.

1779, 23<sup>d</sup> November, an *Eclipse* of the Moon.

					<i>Apparent Time correct.</i>
Beginning	-	-	-	-	12.02.33,0
Shadow well defined	-	-	-	-	03.36,0
Aristarchus	-	-	-	-	10.37,1
					Infula

				<i>Apparent Time correct.</i>		
				h	'	"
Infula Ventorum	-	-	-	12.	14.	32,9
Copernicus	-	-	-	21.	18,	9
Mare Vaporum	-	-	-	32.	07,	8
Bright spot in Mare Vaporum	-	-	-	34.	27,	7
Tycho's body touched	-	-	-	35.	29,	7
Mare Serenitatis, do. the border	-	-	-	35.	47,	7
Tycho passed	-	-	-	36.	52,	7
Mare Tranquillitatis touched	-	-	-	40.	17,	6
Ariadæ	-	-	-	41.	37,	6
Mare Serenitatis passed	-	-	-	44.	07,	6
Meerob	-	-	-	51.	37,	5
Mare Crisium touched	-	-	-	52.	37,	5
Do. passed	-	-	-	56.	40,	4
Total darkness by eye	-	-	-	13.	00.	37,5
By telescope	-	-	-	01.	41,	3
Do. end by telescope	-	-	-	14.	40.	13,3
By eye	-	-	-	41.	16,	3
Grimaldus passed	-	-	-	43.	06,	3
Aristarchus	-	-	-	50.	42,	2
Infula Ventorum touched	-	-	-	53.	46,	2
Passed	-	-	-	54.	20,	2
Copernicus	-	-	-	15.	02.	44,1
Tycho's body touched	-	-	-	04.	56,	0
Passed	-	-	-	06.	23,	0
Mare Crisium touched	-	-	-	32.	22,	7
Passed	-	-	-	35.	55,	7
Mare Fæcunditatis passed	-	-	-	37.	23,	6
End by telescope, doubtful	-	-	-	39.	45,	6
Certain	-	-	-	42.	00,	6





*Apparent Time correct.*

1780, 18th February, ☾ East limb passed	h	,	"
the meridian	-	-	-
			10.39.31,6
15th April, ☾ West limb passed the me-			
ridian	-	-	-
			9.17.34

*5th August, an Appulse of the Moon to Jupiter.*

☾ West limb passed a circle of the meridian							7.14.44
Jupiter's western limb	-	-	-	-	-	-	14.48
Eastern do.	-	-	-	-	-	-	14.58
Center	-	-	-	-	-	-	18.49
☾ West limb	-	-	-	-	-	-	00.53
Jupiter's center	-	-	-	-	-	-	25.06
☾	-	-	-	-	-	-	25.19
Jupiter's center	-	-	-	-	-	-	42.31
☾	-	-	-	-	-	-	43.08
Jupiter	-	-	-	-	-	-	51.21
☾	-	-	-	-	-	-	52.15
Jupiter	-	-	-	-	-	-	8.42.22
☾	-	-	-	-	-	-	44.42
The difference of declination of Jupiter							
and the nearest horn of the Moon, was							
9'.01",4	-	-	-	-	-	-	7.28.40

*Distances of Limbs.*

14.33,2	-	-	-	-	-	-	7.32.12
15.01,5	-	-	-	-	-	-	35.36
15.32,7	-	-	-	-	-	-	38.53
16.25,9	-	-	-	-	-	-	44.31
17.06,5	-	-	-	-	-	-	48.16
30.58,6	-	-	-	-	-	-	8.35.49

OBSERVATIONS





Aldeberan	83.29.09,7	6,7	+ 0,82	- 0,63	89.29.03,2	16.02.58	N.	22.33.54,8
Rigel	58.57.52,2	33,7	- 5,1	+ 0,12	58.57.13,8	8.28.15,9	S.	34.30,3
$\alpha$ Orion	74.47.00	15,3	- 2,2	+ 1,28	74.46.43,8	7.20.57	N.	34.13,8
$\gamma$ Geminorum	84.00.29,9	6,0	+ 2,5	+ 2,00	84.00.28,4	16.34.11	N.	33.47,6
Syrius	51.00.43,5	45,5	+ 4,6	- 2,75	51.00.00	16.25.04,3	S.	34.15.7
						Mean		22.34 07,4
Capella	66.47.18	23,5	+ 6,8	- 0,06	66.47.00,3	45.45.12,5		22.32.12,8
$\beta$ Tauri	84.08.43	5,6	+ 2,4	+ 0,37	84.08.40,2	28.24.08		48,2
$\iota$ 36 Tauri	84.59.37,1	4,8	+ 1,2	+ 1,2	84.59.34,7	27.32.27,1		01,8
$\theta$ Aurigæ	75.21.42.8	15,0	+ 2,4	+ 1,2	75.21.31,4	37.10.34		05,4
$\epsilon$ Geminorum	87.12.30	2,9	- 0,4	+ 2,6	87.12.29 3	25.19.52,4		11.7
						Mean		22.32.16
						Mean of the last two sets		22 33 11,7
						Double collimation or difference of the last two sets		1.51,4
						Latitude by the whole		22.33.10,55



## TRIVATOORE.

*Observations by T. D. P. 1783.*

	Day	h	'	"
☉ On the meridian, Dec. 5th,	23.33.52,5	flow	26.07,4	
☉ On the meridian, Dec. 6th,	23.35.53,1	flow	24.06,9	
Daily gain,	-	-	2.00,6	

The equation of equal altitudes was applied.

*An Emerfion of Jupiter's first Satellite.*

	h	'	"
6th Dec. by watch emerged	6.31.53		
Too flow at noon	+26.07,3		
Gain till observation	34,4		
	<hr/>		
Emerfion	6.57.25,9		
Ephemeris	1.36.52,0		
	<hr/>		
Longitude in time	5.20.33,9		
in degrees	80.08.28,5		

☉ On the meridian, Dec. 28	23.26.37
Equation of E. A.	- - 1,9

26.29.35,1 flow 33.24,9  
On

	h	
☉ On the meridian, Dec. 30	23.23.40,3	
Equation of E. A. - - -	1,9	
	<hr/>	
	23.23.38,4	flow 36.21,6
Daily loss	88,4	

*An Emerfion of Jupiter's first Satellite.*

29th of Dec. by watch emerged - -	h	
	6.27.07	
Too flow at noon - -	33.24,9	
Loss till observation at 88,4	25,8	
Emerfion	7.00.57,7	
Ephemeris	1.40.44,0	
	<hr/>	
Longitude in time	5.20.13,7	
	in degrees	80.03.24,6
The mean of the two longitudes		80.05,56,5

The distance between the flag in the fort, and the place of observation at *Trivatoore*, was determined by a long base measured in the sands, and by taking angles for trigonometrical calculations.

*Madras* flag, distance - - 2787,1 feet.  
 Bearing - S. 10.33.50 W.

Which gives difference of Longitude 50,5  
 Latitude 4.30,7

*V I P E R E E.*

Having borrowed the quadrant that Mr. HURST used in the transit of *Venus*, I was desired not to alter its  
 Vol. I. G line



line of collimation till I had determined the quantity of error: those observations are in the tables of latitude. It was used in the survey to *Calcutta*.

As I intended to observe at this place, I determined its distance from the fort as accurately as I could by trigonometry. The result is:

*Madras* flag, distance - 8072,2 feet  
bearing S. 23.15,00 E.

Which gives difference of Latitude  $31''{,}5$

### M A D R A S.

Latitude of <i>Trivatoore</i> , see table	-	$13^{\circ}.09.00,4$
<i>Madras</i> south of it	-	$— 4.30,7$

---

Latitude  $13. 4.29,7$

Latitude of <i>Viperee</i> , see table	-	$13.05.05,4$
<i>Madras</i> south of it	-	$— 31,5$

---

Latitude  $13.04.33,9$

Mean  $13.04.31,8$

Longitude of <i>Trivatoore</i> , Mean	-	$80.05.56,5$
<i>Madras</i> west of it	-	$— 00.50,5$

---

Longitude  $80.05.06,0$

*WUNGOLE*, 1782, commonly called *ONGOLE*.

*Observations by T. D. P.*

14th November, double altitudes of the pole, with the small sextant made by RAMSDEN, and the artificial horizon.

<i>Watch.</i>	<i>Angles.</i>	
9.16.12	34.45.30	} these were with the small sextant.
21.00	47.30	
31.00	45.30	
<hr/> 49.00	<hr/> 46.30	this was with the large sextant.
9.29.18	34.46.15	
	17.23.08	
	+ 2.40	* beneath meridian.
	— 2.58	refraction.
	<hr/> 17.22.50	meridian altitude.
	1.51.13	polar distance.
	<hr/> 15.31.37	Latitude.

16th November, with the octant double altitudes of the  
*Sun.*

	<i>Upper L.</i>	<i>Lower L.</i>
12.00.28	111.51.00	
2.24	54.00	
4.14		110.48.20 M. A.
5.41	111.56.00 M. A.	
6.36		110.47.00
Observed altitude		55.41.05
Ref. and par.		— 34
Meridian altitude correct		<hr/> 55.40.31
Declination S.		18.49.05
Co. Latitude		<hr/> 74.29.36
Latitude		<hr/> 15.30.24



1784, The Latitude observed by T. D. P. (see observations at large) was

$15^{\circ}.29'.16''$

This is inserted only to bring to test the accuracy of the octant, which is mentioned (page 58) in the Introduction: and it appears that, by a single observation made with it, the Latitude was determined within  $1'.8''$ .

It serves also to shew that, though it is very difficult to take double altitudes of so faint a star, in low latitudes, even the polar star may be used to great advantage: and in these hot climates the stars only can be employed, for the *Sun's* heat at noon, after a long march, is really not to be borne by any constitution.

*MASULIPATAM, 1782, by T. D. P.*

27th Oct. ☉ diameter forward 33, } then set the speculum to  
backward, 32, }  $90^{\circ}$ , and shifted the index back.

Double altitudes of the *Sun's* lower limb, taken with the HADLEY's octant and the artificial horizon.

<i>Watch.</i>	<i>Angles.</i>
h ' "	° ' "
12.19.21	120.52.20
20.32	120.55.20
28.17	121.21.00
30.40	121.23.30
31.38	121.24.00
32.34	121.25.40 meridian.
34.23	121.23.20

Observed

Observed meridian altitude	-	L. L.	60.42.50
Error of quadrant	-	-	— 30
Semi-diameter	-	-	+ 16.10
Ref. and par.	-	-	— 27

Altitude	-	60.58.03
Declination S.	-	12.51.09

Co. Latitude	73.49.12
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Latitude	16.10.48
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28th October, quadrant the same as above.

The mode the same, double altitude 120.45.00

Meridian altitude correct - - 60.37.42

Declination - - S. 13.11.55

Co. Latitude	73.49.37
--------------	----------

Latitude	16.10.23
----------	----------

1st Nov. ☉ diameter 34 forwards, } then set the spec-  
33 backwards, } culum to 90°.

Time.	Upper L.	Lower L.
h		
12.14.56		

119.13.10

15.33

118.04.30 M. A.

16.11

119.14.50 M. A.

Observed meridian altitude	-	-	59.19.50
Ref. and par.	-	-	— 30
Error of quadrant	-	-	— 30

Meridian altitude 59.18.50

Declination - S. 14.30.45

Co. Latitude	73.49.35
--------------	----------

Latitude	16.10.25
----------	----------

The



The same day Lieutenant HUMPHREYS observed with a sextant made by RAMSDEN, about four inches radius: he made the angles of the lower limb  $118^{\circ} 09'.00''$ ; and the error of his quadrant was  $-2'$ , which gave the latitude  $16^{\circ}.11'.05''$ . This was intended as a kind of test of the instruments, but it was not a fair one, and yet the result is closer than could be expected, considering the difficulty of reading the small one.

Mean of three latitudes with octant  $16^{\circ}.10'.32''$

☉ On Meridian, Oct. 29th,	h	00.04.56	too fast	4.56
By the small watch — 30th,		00.08.36,5		8.36,5
— 31st,		00.12.37		12.37
Nov. 1st,		00.16.36,5		16.36,5

### Examination of the large watch used at the observation of *Jupiter's* Satellite.

29th October, altered the spring, and set it a-going at one o'clock.

	Small Watch.	Large Watch.
	h	
Octo. 29th	22.37.00	
Too fast	8.23,2	
	<hr/>	
Solar time	22.28.36,8	h
		22.34.42 too fast 6.05,2
	h	
Nov. 1st	1.46.00	
Too fast	0.16.54	
	<hr/>	
Solar time	1.29.06	1.35.57,5 too fast 6.51,5

Therefore in 51 hours solar time the large watch gained  $46''.3$ .

*An Emerfion of Jupiter's first Satelllite.*

	h
1st November, by watch emerged - -	7.27.20
At laft obfervation, too faft	— 06.51,5
Gained afterwards at 46",3	— 05,3
	<hr/>
Emerfion	7.20.23,2
Ephemeris	1.56.15
	<hr/>
Longitude in time	5.24.08,2
	<hr/>
in degrees	81.02.03

The obfervations before written were made at the Chief's garden. The Fort flag was diftant 2'.5" in a ftraight line, and bore S. by E. which gives difference of

Longitude - - -	+ 0.30
Latitude - - -	— 2.28
Longitude of Gardens	81.2.03
	+ 30
	<hr/>
Longitude of Flag	81.2.33
Latitude of Gardens	16.10.32
	— 2.28
	<hr/>
Latitude of the Flag	16.08.04

*P E D D A P O O R E, 1784.*

*Obfervations by T. D. P.*

	h
$\alpha$ <i>Serpentis</i> , on the meridian, June 18th -	9.36.45
Ditto - 19th -	9.28.57,5
	<hr/>
	7.47,5
Acceleration for the time	4.09,4
	<hr/>
Loss in one day	3.38,1
	⊙ On



☉ On the meridian, June 18,  $23^{\text{h}}.51'.47''.75$  flow  $8^{\text{h}}.12'.25''$

*An Immersion of Jupiter's first Satellite.*

The Planet was extremely bright, and the Belts distinct and clear; the glass perfectly steady

19th June, by watch changed colour  $15^{\text{h}}.16'.22''$

Immerged	$15.18.38$
Too flow at moon	+ $8.12,25$
Loss to observation at 219	+ $2.21$

Immersion	$15.29.11,15$
Ephemeris	$10.00.13$

Longitude in time  $5.28.58,25$

in degrees  $82^{\circ}.14'.34''$

From the observations at *Calcutta*, it appears that there is a difference between the Longitudes derived from observations of immersions and emersions.

The mean of Longitudes, 10 in number, derived from observations of immersion, with an 18 inch reflector, was  $5.53.53,77$

Of emersions (2) with the same instrument, was  $5.53.43, 4$

The single emersion with *Dollond's* triple object glass is  $5.53.57, 8$

The mean of 4 emersions with the same  $5.53. 3, 9$

Difference by the reflector  $0. 0.10,77$

By *Dollond's* refractor  $0.00.54,90$

The mean of all the immersions (11)  $5.53.54,13$

Emersions (6)  $5.53.17, 4$

Difference  $36,73$   
As

As the glass with which the observation was made differed from both, the difference derived from the whole is to be preferred, and so  $9'.25''$  are to be subtracted from this, to compare it with the other places, which were all emersions, and then the longitudes of *Peddapoore* by emersions will be  $82^{\circ}.05'.19''$ .

*K O S S I M K O T T A*, 1782.

*Observations by T. D. P.*

9th October, double altitudes of *Jupiter* from the artificial horizon.

h	"	"	°	'	"	h	"	"
7.47.00	—	55.10.00				17.32.06,7		
48.36	—	54.28.50						
49.57	—	54.01.20				23.12.10		
50.58	—	53.37.10				13.00.24,8		
52.02	—	53.13.10				17.42.30		
53.05	—	52.50.00						

7.50.16 Mean, 26.56.43 Apparent altitude.  
— 1.51 Ref,

26.54.52

From the above data the planet had passed the meridian

*Jupiter's* R. A. 17.32.06,7  
20.48.44  
☉ R. A. 13.00.25

Time 7.48.19  
Watch 7.50.16

Too fast 1.57

The watch gained  $12''$  daily by the meridian of *Vizacpatam*.

*An*



*An Emerfion of Jupiter's first Satellite.*

9th October, by clock emerged	<sup>h</sup> 7.11.45
Too fast at the observation	— 1.57

Emerfion	7.09.48
Ephemeris	1.38.00

Longitude in time	5.31.48
-------------------	---------

in degrees	82.57.00
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*VIZACPATAM, 1782.**Observations by T. D. P.**An Emerfion of Jupiter's second Satellite.*

3d October, emerged	<sup>h</sup> 8.30.58
Ephemeris	2.57.20

Longitude	5.33.38
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<sup>o</sup> 83.24.30
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*An Immerfion of Jupiter's third Satellite.*

7th October, immerfion	<sup>h</sup> 8.9.57
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The time was fhewn by Mr. RUSSELL's time-keeper, which was made by ARNOLD, and was regulated by the meridian line in his hall.

*7th September, an Emerfion of Jupiter's first Satellite.  
by T. D. P. 1784.*

7th September, by watch emerged	-	<sup>h</sup> 8.23.38
Sky remarkably clear, and glafs steady.		
Full fplendor	- - - - -	25.40

*Observations*

*Observations for Time.*

			Zenith Distance.
	h	' "	o ' "
7th Sept. ☉ U. L.	22.22.25	} By arch of 90	41.29.20
	24.48		D.S D. Non.
Lat. by 2 northern stars		96	44.01.01
2 southern stars			17.44.33,4
			17.38.46,5
N. B. Refraction + 50			17.41.45
True Latitude			Error of collimation + 02.58
☉ Declination for the time and place N.			5.30.39
From the above data the time was			21.17.15,5
By the watch			20.23.36,5

The watch too flow 53.39  
*Middle Wire. Upper Wire.*

	h	' "	h	' "
8th Sept. α <i>Aquilla</i> rising	7.01.13		7.03.16	
falling	8.07.35		8.05.30	

	h	' "	h	' "
On the meridian	7.34.24		7.34.23	
Passage by calculation			8.29.55,5	

Watch too flow 55.32

*8th September, ☉ Zenith Distance.*

	h	' "	D. S. D. Non.	Zenith Distance.
	h	' "		o ' "
☉ L.	19.13.55		90	56.59.20
☉ U.	16.06		96 60.03.05	56.59.23
U.	16.49		90	56.18.20
L.	19.00		96 60.00.07	56.18.04,6
U.	21.57		90	55.05.00
L.	24.09		96 58.03.00	55.04.41,2
U.	25.18		90	54.18.00
L.	27.28		96 57.03.20	54.17.12,7
	19.20.20		Mean	55.40.00,3

☉ Declination



☉ Declination N. 5.09.42<sup>0</sup>

Latitude 17.41.45<sup>h</sup>

From the above data time 20.17.30<sup>h</sup>

Watch 19.20.20

Watch flow 57.10

Therefore the watch lost in 22.57 211,0<sup>h</sup>

And consequently daily - 221,0

Day	h	'	"		h	'	"
8 at	7.34.23.5			watch too flow	55.27.9		
7 at	8.23.38			the emerfion happened			0.55.32,0

Difference 23.10.45,5 Loss in this time at 221, —3.33

Therefore flow at emerfion 51.59

Emerfion by watch 8.23.38

Time of emerfion 9.15.37

Ephemeris 3.42.56

Longitude in time 5.32.41

in degrees 83.10.15<sup>0</sup>

*October 23d, an Observation of Jupiter's first Satellite,  
by Mr. MAXTON.*

The glafs the fame as mine; and the watch corrected  
by Mr. RUSSELL's meridian line.

Emerfion by watch	10.5.30 <sup>h</sup>
Watch fast	— 6.05

Emerfion 9.59.25

Ephemeris 4 26.08

Longitude in time 5.33.17

in degrees 83.19.15<sup>0</sup>

This

This was the instant of first appearance, as well as Lieutenant COLEBROOKE's, who observed the same at *Vizianagarum* Palace.

Longitude by T. D. P.	83.10.15
by M. - -	83.19.15
	<hr/>
Mean	83.14.45

Mr. RUSSELL also made an observation, which I do not use, because he noted the time of full splendor, which is uncertain: it follows:

16th October, Watch fast at noon	h	1,43,5
gained daily	56",5	
Add its gain to the observation		18,5
		<hr/>
Watch fast	—	2.02
Time of full splendor	8.	4.39
		<hr/>
Time of observation	8.	2.37
Ephemeris		2.29.17
		<hr/>
Longitude in time		5.33.20
		<hr/>
in degrees		83.20.00

*B E E M U L W I L S A*, 1784.

*Observations by Lieutenant COLEBROOKE.*

☉ On Meridian, Aug. 7th	h	23.40.23,15
Equation of E. A.		+ ,60
		<hr/>
		23.40.23,75
	flow	19.36,25
	On	



	h	
☉ On Meridian, Aug. 12th	23.22.30,5	
Equation of E. A.	+ 0,75	
	<hr/>	
	23.22.31,25	flow 37.28,75
		<hr/>
	Loss in 5 days	17.52,50
	Daily loss	- 3.34, 5

*An Immersion of Jupiter's second Satellite.*

This was with his first observation.	h	
8th August, by watch immersed	12.33.20	
Too flow at noon	19.36,25	
Loss to the observation, at 214",5	1.55. 2	
	<hr/>	
Immersion	12.54.51,45	
Ephemeris	7.20.50	
	<hr/>	
Longitude in time	5.34.01,45	
	in degrees	83.30.15,00

*August 13th, by T. D. P.*

Jupiter's first Satellite vanished by the watch h , " 11.32.28

6 or 8 seconds before the time noted, it had not changed colour: a cloud came on, and hid it for about 8 seconds, and when it was gone, the Satellite had vanished.

*August 20th, by T. D. P.*

Jupiter's first Satellite vanished by the watch h , " 14.2.30

The sky was clear, the glass steady. Here I expected what happened, and was on my guard. The Satellite vanished at a small distance from the body, *i. e.* before the contact, and without changing colour.

On

Day h  
 ☉ On Meridian, Aug. 19th 23.57.13,25  
 Equation of E. A. + 1,5

19th 23.57.14,75 flow 2.45,25

Immediately before this observation, the watch was set forward one hour without stopping. By comparing this with the observation of the 12th, the watch lost daily 3'.36",6.

The foregoing observation of time is only of use for the erroneous immerfions of the 13th and 20th.

Day h  
 ☉ On Meridian, Aug. 27th 23.41.26,5  
 Equation of E. A. + 2,1

27th 23.41.28,6 flow 18,31,4

☉ On Meridian, Aug. 29th 23.35.17,5  
 Equation of E. A. + 2,4

23.35.19,9 flow 24.40,1

Daily loss 3.04,4

*An Emerfion of Jupiter's first Satellite,  
 By Lieut. COLEBROOKE.*

29th August, by watch emerged 12.27.00  
 Too flow at noon after the observation + 24.40,1  
 Loss after the observation — 1.25,5

Emerfion 12.50.14,6  
 Ephemeris 7.16.33

Longitude in time 5.33.41,6

in degrees 83.25.16

*Observations*



*Observations by T. D. P.*

	h	'	"
☉ On the Meridian, Sept. 2	23.20.47		
Equation of E. A.	+02,5		
	<hr/>		
	23.20.49,5	flow	39.10,5

	h	'	"
☉ Altitude, 5th Sept.	21.53.55,5	67.31.35	
Refraction and parallax		— 20	
Collimation		+ 51	
	<hr/>		
	67.32.06		

☉ Declination at the time and place	6.14.26
Latitude	17.53.32

	h	'	"
From which data the time was	22.41.10,0		
By the watch	21.53.55,5	flow	47.20,5

Whence the daily was 167.7

*An Emerfion of Jupiter's firft Satellite.*

The fky clear of clouds, and the glafs fteady; but the vapours had a perceptible motion through the telescope. The Belts were very diftinct.

5th Sep-

5th September, by watch emerged  $\begin{matrix} h & ' & '' \\ 14.00.35 \end{matrix}$

N. B. Full splendor  $\begin{matrix} h & ' & '' \\ 14.2.15 \end{matrix}$ . Too flow at  
the altitude of the  $\odot$  taken after the  
observation - - - - - + 47.20,5  
Loss after the observation, at 167'',7 - 54,4

Emerfion  $\begin{matrix} h & ' & '' \\ 14.47.01,1 \end{matrix}$   
Ephemeris  $\begin{matrix} h & ' & '' \\ 9.13.36 \end{matrix}$

Longitude in time -  $\begin{matrix} h & ' & '' \\ 5.33.25,1 \end{matrix}$   
in degrees  $\begin{matrix} ^\circ & ' & '' \\ 83.21.18 \end{matrix}$

*Observations by Lieutenant COLEBROOKE.*

$\odot$  On Meridian, Sept. 29th  $\begin{matrix} h & ' & '' \\ 23.38.27,6 \end{matrix}$   
Equation of E. A. + 5,4  

---

 $\begin{matrix} h & ' & '' \\ 23.38.33,0 \end{matrix}$  flow  $\begin{matrix} h & ' & '' \\ 21.27,0 \end{matrix}$   
Equation of time  $\begin{matrix} h & ' & '' \\ 23.49.46,4 \end{matrix}$   

---

flow 11.13,4

$\odot$  On Meridian, Oct. 1st  $\begin{matrix} h & ' & '' \\ 23.32.17,3 \end{matrix}$   
Equation of E. A. + 5,7  

---

 $\begin{matrix} h & ' & '' \\ 23.32.23,0 \end{matrix}$  flow  $\begin{matrix} h & ' & '' \\ 27.37,0 \end{matrix}$   
Equation of time  $\begin{matrix} h & ' & '' \\ 23.49.08,6 \end{matrix}$   

---

flow 16.45,6

Daily loss on solar time  $\begin{matrix} h & ' & '' \\ 3.05,1 \end{matrix}$



*An Emerfion of Jupiter's firft Satellite.*

30th of Sept. by watch emerged	- -	h 9.15.10
Too flow at noon	- -	+21.27
Loss till obfervation at 185",1		+ 1,15
		<hr/>
	Emerfion	9.37.52
	Ephemeris	4.05.02
		<hr/>
	Longitude in time	5.32.50
		0
	in degrees	83.12.30

I fufpect that a miftake was committed in writing down the time, and that it ought to have been <sup>h</sup>9,16,10. But this is as it is entered in the original book.

13th October, at 1.48 fet the watch forward one hour without ftopping it.

☉ On Meridian, Oct. 15th	h 23.51.53,5	
Equation of E. A. -	+ 6,8	
	<hr/>	
	23.52.00,3	flow 7.59,7
Equation of time	23.45.31,7	faft 6.28,6

The obfervation of the ☉ paffage over the meridian was not taken the next day after the emerfion as ufual, and between the 17th and 18th the watch ran down; therefore the rate is afcertained from the mean time, compared with the 29th September and 1ft October.

And

And the watch lost by the 1st	173,6 daily
by the 2d	174,7
	<hr/>
Mean	174,7
Daily variation	+11,5
	<hr/>
Daily loss on solar time	185,7

*An Emerfion of Jupiter's first Satellite.*

	h	'	"
16th October, by watch emerged	7.53.35		
Too flow at noon	+ 7.59,7		
Loss till observation at 185'',7	+ 1.01,9		
	<hr/>		
Emerfion	8.02.36,6		
Ephemeris	2.29.17,0		
	<hr/>		
Longitude in time	5.33.19,6		
	0		
in degrees	83.19.54		

*Result of the Observation of Longitude.*

	h	'	"	0	'	"
29th August, COLEBROOKE	83.25.16			83.25.16		
5th September, PEARSE	83.21.18			83.21.18		
30th ditto, COLEBROOKE	82.12.30			rejected.		
16th October, COLEBROOKE	83.19.54			83.19.54		
	<hr/>			<hr/>		
Mean	83.19.44,5			83.22.09,3		

*VIZIANAGARUM PALACE.*

*An Observation of Jupiter's second Satellite, by T. D. P.*

	h	'	"
22d October, by watch emerged	7.16.06		
Full splendor	18.18		



*Observations by Lieutenant COLEBROOKE.*

	Equal Altitudes.
	h ' "
* <i>Fumulhoot</i> rising	7.48.10
falling	9.44.25
<hr/>	
* On the Meridian	8.46.17,5
By calculation	8.54.35,5 flow 8.18
<hr/>	
☉ On the Meridian, Oct. 22d	23.50.14,5
Equation of E. A.	+ 7,0
<hr/>	
	23.50.21,5 flow 9.38,5
<hr/>	
23d Oct. * <i>Fumulhoot</i> rising	7.51.39
falling	9.29.05
<hr/>	
* On the Meridian	8.40.22
By calculation	8.50.46,2 flow 10.24,2
<hr/>	
☉ On the Meridian, 23d	23.48.10,3
Equation of E. A.	+ 7,6
<hr/>	
	23.48.17,3 flow 11.42,7
<hr/>	
From the above, daily loss 125,2	

*An Emerfion of Jupiter's firft Satelllite.*

	h ' "
By watch emerged	9.48.55

22d Oct. *Jupiter's* second Satellite emerged  $h \quad 7.16.06$   
 By *Fumulhoot*, watch flow  $+ 8.18$

$h$   
 Loss in 1.30 after emerfion, at 125,2  $— \quad 07,8$

Emerfion  $7.24.16,2$

Ephemeris  $1.49.57$

Longitude in time  $5.34.19,2$

in degrees  $83.34.48$

23d Oct. *Jupiter's* first Satellite emerged  $9.48.55$   
 By *Fumulhoot* too flow  $h \quad + 10.24,6$

$h$   
 Loss in 1.8. after *Fumulhoot* passed at 125,2  $+ 06,0$

Emerfion  $9.59.25,6^{\circ}$

Ephemeris  $4.26.08,0$

Longitude in time  $5.33.17,6$

in degrees  $83.19.54,0$

Mr. MAXTON observed this at *Vizacpatam*: and the two observations shew only 39" difference of longitude; but the high hill that lies to the north of the Palace bore from *Beemulwilfa*, N.  $8^{\circ}.25'$  E. and by trigonometry its distance was 22,978 miles, therefore it lay north of *Beemulwilfa*  $19'.28''$  and east  $2'.52''$ . The Palace lies  $12'.20'',3$  to the north by observations at large, and therefore to the east  $1'.48''$ . But *Beemulwilfa* lies to the east of *Vizacpatam*. Mr. MAXTON's eye, it may be presumed,



presumed, is not so quick as Lieutenant COLEBROOKE'S, and will suffice to account for the difference; for, by a particular survey round these parts, *Vizianagur* Fort does lie 6'.36" east of *Vizacpatam*.

### NARRAINPORE,

Which, by the table of the route, lies west of *Vizianagarum* Palace 2'.

*Observations by Lieutenant COLEBROOKE for Time.*

On the Meridian Oct. 31st	h	23.36.04,3	
Equation		+ 6,4	
		<hr/>	
		23.36.10,7	flow 23.49,3
		<hr/>	
November 1st		23.34.39,5	
Equation		+ 6,8	
		<hr/>	
		23.34.46,3	flow 25.13,7
			<hr/>
		Daily loss	1.24,4

### *An Observation of Jupiter's first Satellite.*

Sky remarkably clear, and glass steady	h	
31st October, emerged by watch		6.00.45
Too slow at noon		23.49,3
Loss till observation at 84",4		22,5
		<hr/>
Emerfion		6.24.56,8
Ephemeris		51.26
		<hr/>
Longitude in time		5.33.30,8
		<hr/>
in degrees		83.22.42,0

KALINGA-

## KALINGAPATAM, 1784.

*Observations by Lieutenant COLEBROOKE for Time.*

☉ On Meridian, Nov. 7th	h	23.50.56,5
Equation of E. A.		+ 6,8
		<hr/>
		23.51.03,3
β Cassiopææ on the Meridian	flow	8.56,7
		8.49.48
by calculation	flow	9.00.01,6
		10.13,6

Therefore the watch lost 1.16,9 in 9 hours, and 205,06 daily.

N. B. The watch had run down on the 5th, and the weather was changing from dry to cloudy, which ended in rain.

*For Longitude.**An Emerfion of Jupiter's first Satellite.*

Glas steady, atmosphere rather thick.	h	8.13.35
By watch emerged		
Too flow by the star		+ 10.13,6
The star passed after the emerfion 36'; loss		
for that time		— 5,1

Emerfion	8.23.43,5
Ephemeris	2.47,01,0

Longitude in time 5.36.42,5

in degrees 84.10.37,5

IECHA-



## IECHAPOORE, 1782.

*Observations by T. D. P.*

Double altitudes of *Jupiter*, with the octant and artificial horizon.

Time.	Angles.		
h 8.10.03	— 64.28.10	<i>Jupiter's</i> R. A. at the time	h 17.21.46,6
13.03	— 63.30.00	Declination S.	23.02.04
15.08	— 62.45.20.	⊙ R. A. at the time	h 11.55.08,2
18.53	— 61.50.30	Latitude by COLEBROOKE, 1784, see Table	
8.14.17	Mean 31.34.15	See Observations at large	19.06.45
	Ref. — 1.34		

31.32.41

From the above data, *Jupiter* had passed the meridian.

h 2.45.59,2, and the time was	h 8.12.37,6
Watch	8.14.17
Too fast	1.39,4

*An Eclipse of the Moon.*

h 21st Sept. 7.00.15	doubtful.
01.40	begun certainly.
02.40	strong shadow came on.
04.14	penumbra touched a place which I name A.
09.03	shadow touched A.
9.06.56	shadow touched the limb at B.
08.11	penumbra going.
10.12	limb not perfectly bright.
11.20	end certainly, and at B.

By

By comparison of the observations at A, it appears that the shadow required  $4'.49''$  to move through the breadth of the penumbra. By comparing those at B, it appears that  $4'.24''$  were then sufficient.

The mean of these will be very near the truth; it is  $4'.37''$ .

	h
Shadow came on	7.02.40
Advance of penumbra	— 04.37
Beginning of eclipse	6.58.03
Shadow touched the limb	9.06.56
Retreat of penumbra	+ 04.37
End of eclipse	9.11 33
Duration observed	2.13.30
Duration by ephemeris	2.08.30
	+ 05.00
By ephemeris end	3.28
Beginning	1.19.30
Duration	2.08 30
Ephemeris middle	2.23.45
Middle observed by watch	8.04.48
Too fast	— 1 39.4
	8.03 08,6
Ephemeris	2.23 45
Longitude in time	5.39.23,6
degrees	84.50.54



## GANJAM FORT, 1782.

*Observations by T. D. P. Latitude determined.*

		h
4th September, horizon clear, octant	-	19.21.30
6th very hazy, by sextant and quadrant,		
both agreed	- - -	19.21.03
16th	Sextant	19.21.50
	Octant	19.19.50
	Mean	19.21.03

These were taken from the top of the Chief's house: the sea was the horizon; the height above the area of the fort was measured, but the height of that area was guessed at; the dip was taken corresponding to this height from the tables.

*An Observation of Jupiter's fourth Satellite.*

	h
16th September, 1782, immersion	6.45.27
The change of colour was noted at	6.44.04

Clouds prevented the observing of the emerfion of this and the immersion of the first, which happened that night.

## GANJAM CAMP, 1784.

*Observations by Lieut. COLEBROOKE.*

☉ On the Meridian, Nov. 20th	23.57.36,3
Equation of E. A.	+ 05,5

---

 23.57.41,8 flow 2.18,2

☉ On

$$\begin{array}{rcl}
 \odot \text{ On the Meridian, Nov. 21st} & \text{h} & 23.56.00 \\
 \text{Equation of E. A.} & & + 05,5 \\
 \hline
 & & 23.56.05,5 \text{ flow } 3.54,5
 \end{array}$$

$$\begin{array}{rcl}
 \odot \text{ On the Meridian, 22d} & \text{h} & 23.54.15,0 \\
 \text{Equation of E. A.} & & 05,4 \\
 \hline
 & & 23.54.20,4 \text{ flow } 5.59,6
 \end{array}$$

\*  $\epsilon$  *Cassiopeæ*, 24th November.

	<i>First Wire.</i>	<i>Middle.</i>	<i>Upper.</i>
	h. , "	, "	, "
Rising	7.28.20	34.40	42.40
Falling	9.35.53	29.35	21.37
	<hr/>	<hr/>	<hr/>
On the Meridian	8.32.06,5	32.07,5	32.08,5 = 8.32.07,5
		By calculation	8.39.51,2
			<hr/>
		Slow	7.43,7

Which, compared with the last solar observation, gives  $91'',3$  daily loss.

*An Emerfion of Jupiter's first Satellite.*

24th November, by watch emerged	h , "	6.37.35
Too flow by the star		+ 7.43,7
Loss after the emerfion, at $91'',3$		<hr/> — 7,3
		<hr/>
Emerfion		6.45.11,4
Ephemeris		1.04.39
		<hr/>
Longitude in time		5.40.32,4
		<hr/>
in degrees		$86^{\circ}.08.06$

JEHAUD.



# JEHAUD JEPOORE, 1784.

*Observations by Lieut. COLEBROOKE.*

17th Dec. * $\epsilon$ Cassiopææ	h	,	"	,	"
rising	6.31.40			42.03	
falling	8.05.53			55.31	
					h
* On the Meridian	7.18.46,5			18.47	= 7.18.46,7
	By calculation			7.54.48,7	
	Watch flow			36.02,0	
☉ On the Meridian, 17th	h	,	"		
Equation of E. A.	23.23.59,3			+1	
	23.24.00			flow	36,00

## *An Emerfion of Jupiter's first Satellite.*

	h	,	"
By watch emerged	6.21.25		
Too flow by the*	36.02		
Emerfion	6.57.27		
Ephemeris	1.11.50		
Longitude in time	5.45.37		

in degrees 86.24.15

## SOOBUNREEKA RIVER CAMP, 1784.

*Observations by Lieutenant COLEBROOKE.*N. B. *Opposite Jellafore, on the Ballafore side of the River.*

h	;	"
⊙ On the Meridian, Dec. 24th	23.19.34,1	
Equation of E. A.	— 7	
	<hr/>	
	23.19.33,4	flow 40.26,6

⊙ On the Meridian, Dec. 25th	23.18.12
Equation of E. A.	— 1
	<hr/>
	23.18.11 flow 41.49,0

Daily loss 82",4

*An Emerfion of Jupiter's first Satellite!*

17th December, by watch emerged	h	;	"
Full splendor. Too flow at the following	8.12.42		
h noon	40.26,2		
8.13.50 Loss after emerfion, at 82",4	— 52		
	<hr/>		
Emerfion	8.52.16,2		
Ephemeris	3.04.14		
	<hr/>		
Longitude in time	5.48.02,2		
in degrees	87.00.33,0		

An



*An Emerfion of Jupiter's fecond Satelllite.*

25th December, by watch emerged	h ' "
Watch flow	6.04.40
Loss till obfervation, at 82",4	+40.26,6
	+ 23,2
	<hr/>
Emerfion	6.45.29,8
Ephemeris	55.57
	<hr/>
Longitude in time	5.49.32,8
in degrees	87.23.12

*A Comparifon of the Obfervations for Longitudes with  
correfponding Obfervations at different Places, to fix  
the Longitudes of thofe which were undetermined.*

By T. D. PEARSE.

*C A L C U T T A.*

The obfervatory was at the Treasury Gate in *Fort William*.

*Lunar Eclipses.*

1776, July 30, Immerfion at <i>Calcutta</i>	17.01.16
<i>Greenwich</i>	11.08.21 h ' "
	<hr/> 5.52.55

As this was not of the beft, I reject it.

1779, November 23d. I reject the beginning, becaufe, when compared with *Tycho* in the former part, it appears, from a like comparifon of the *Greenwich* obfervations, that it is erroneous a full minute. The firft

*Copernicus* is also rejected. And by comparing the end doubtful with *Tycho* and *Copernicus* of the latter part in both sets, it appears to be the observation that must be compared with the end at *Greenwich*.

	<i>Calcutta.</i>	<i>Greenwich.</i>	<i>Longitude.</i>
	h / "	h / "	h / "
The body of <i>Tycho</i> touched	12.35.30	6.42.29	5.53.01,0
passed	36.53	43.36	17,0
Immersion	13.01.41,3	7.08.08	33,3
Emersion	14.40.13,3	8.46.23	50,3
Grimaldi touched	43.06,3	49.45	21,3
The middle of <i>Copernicus</i>	15.02.44,1	9.08.59,5	44,6
The body of <i>Tycho</i> touched	04.56	11.39	17,0
passed	06.23	12.49	34,0
The end	15.39 45,6	9.46.09	36,6

Mean in time 5.53.28,3

in degrees 88.22.04,5

### Jupiter's *Satellites*.

From the beginning of 1774, till the 27th of December 1777, the observations were made with a middling 18 inch reflector. I allow 24" to compare it with the large reflector at *Greenwich*, and 12" for their refractor. The comparison is of actual corresponding observations, except in two cases, in which the *Calcutta* observations are one revolution later. The Longitudes of *Paris* and *Stockholm* are taken from WARGENTIN, Phil. Trans. vol. 67. LUNDEN, from thirty-three corresponding observations found in that same paper. Of *Chislehurst*, from WOLLASTON, vol. 74. Of *Geneva*, *Oxford*, and *Marseilles*, from PICOT, vol. 68 and 76. *Nagpoore* and *Chunargur* were communicated to me by Lieutenant EWART, of the *Bengal* establishment, who observed at each place a considerable time.



Date.	Place.	Time.	Correction for Longitude or Glass.	Times correct.	LONGITUDE.	
					In Time.	In Degree.
1774, October 14th.	Calcutta, Stockholm,	<i>h</i> ' "	<i>h</i> ' "	<i>h</i> ' "	<i>h</i> ' "	
		12.32.25	1st Sat. Im. + 24	12.32.49		
	Greenwich, Paris, Geneva, Oxford,	07.52.00	— 1.12.21	6.39.39	5.53.10,0	
		0 ' "	1st Sat. Im.	8.35.00		
December 31st.	Calcutta, Lunden,	8.44.47	— 09.25	22		
		8.59.20	— 24.05	15		
	Greenwich,	8.30.26	+ 4.59	25		
		Immersion, Add	Mean, one Revolution 1. Day, 23d	8.35.15,5 18.28 49		
1776, November 11th.	Calcutta, Lunden,	8.57.15	1 Sat. Im. + ' "	3.04. 4,5 8.57.39	5.53.34,5	
		11.25.47	— ' " 24 Em.	11.25.23		
	Greenwich,	6.25.05	52.55	5.32.10	5.53.13,0	
		1st Sat. Im. Add	N. B. Refractor, one Revolution 1. Day, 13th,	13.37.32 18.28.06		
1776, November 11th.	Calcutta, Chislehurst,	13.58.56,3	1 Sat. Im. + ' "	8.05.38 13.59.08,3	5.53.30,3	
		15.31.51,3	3d Sat. Im. + 12	15.32.03,3		
	Calcutta, Chislehurst,	9.38.48,5	— 19	9.38.29,5		

Date.	Place.	Time.	Correction for Longitude or Glass.	Times correct.	LONGITUDE.	
					In Time.	In Degrees.
December 18th.	Calcutta,	15.58.21	2d Sat. Im. / "	15.58.21	5.53.52,0	
	Marfeilles,	10.25.54	--21.25	10.04.29	5.53.29	
					5.53.28	
			Mean by Jupiter's Satellite By Lunar Eclipses -		5.53.28,5	88.22.07,5
Result—Longitude of Calcutta -						
1782, September 21st.						
	Ichapooore,	A LUNAR The shadow	ECLIPSE. touched the limb,	h / " 16,6		
	Nagpoore,	h / " 8.44.22	5.18.46	3.25.36	h / " 5.39.40,6	84.55.09,0
	Koffim Kotta, Nagpoore,	JUPITER'S 1st Sat. E. 6.56.43	SATELLITES. --5.18.46	7.09.48 1.37.57	5.31.51,0	82.57.45
1784, September 5th.	York, Greenwich	9.08.54	+ 4.31	9.13.25 15		
	Paris,	9.22.18	Refraclor, { + glafs, 13 - 9.25	06		
	Beemulwilfa	14.47.01,1	1st Sat. E. Mean, - 12	9.13.15,5 14.46.49,1	5.33.34,0	83.23.30,0
	Kalingapatam, Chunargur,	8.19.45	1st. Sat. E. --5.32.26	8.23.43,5 2.47.09	5.36.34,5	84.08.37,0
November 8th.						



*Observations at large for determining the Latitude of Places.*

Phenomenon and Face of the Quadrant.	Date.	ARCH of 96.		Arch of 90.	Refraction or Equation applied.	Zenith Distance corrected.	Declination.	Latitude by the Observation.	Name of the Place and its correct Latitude.
$\alpha$ Aquilæ, E.	1783, Oct.	D.S.D.N.	° 1 "	° 1 "	"	° 1 "	8.18.24,7N.	° 1 "	Viperec.
	9th.	4. 3.28,3	4.39.36,2	4.40.00	4,3	4.39.52,4		12.58.17,1	
	11th.	6. 3.01,5	4.54.39,2	4.55.00	5	4.54.54,2		13.13.18,9	
	12th.	4. 3.28	4.39.29,6	4.40.00	4,3	4.39.49,1		12.58.13,8	
$\alpha$ Cygni, W.	9th.	33. 1.20,5	31.19.19,3	31.19.10	35,3	31.19.50	44.30.53,8N.	13.11.03,8	
	11th.	33. 1.18,5	31.18.26,5	31.18.30	35,3	31.19.03,6		13.11.50,2	
	11th.	46. 2.18	43.43.32	43.44.00	54,5	43.44.40,5	30.45.43 S.	12.58.57,5	
$\alpha$ Pegasi, W.	11th.	2. 3.12	1. 5.02,4	1. 5.00	1	1. 5.02,2	14. 2.42,8N.	12.57.40,6	
	11th.	0. 3.21	0.51.11,3	0.51.30,0	0,8	0.51.21,5		13.11.21,3	
								12.58.17,2	Viperec.
									° 1 "
4 Stars, Algenib, W.	Nov.	1. 0.00	0.56.15	0.57.00	0,9	0.56.38,4	13.58.34,7N.	13.11.53,5	13.05.05,35
	21st.	0. 3.00	0.42.11,3	0.42.30	0,7	0.42.21,3		13. 1.56,4	Trivatoore.
		79. 3.16	74.53.18	74.53.30	210,0	75.00.12,2	88. 9,08	13.16.13,3	° 1 "
					+			13.08.55,8	13. 9.00,4
$\alpha$ Leonis, E.	1784, April				428,0				
			Below the Pole		—				
	23d,	0. 1.04	0.15.49,2	0.15.55	228,0				
					0		13.00.53 N.	13.16.45	North side of Cortalare River.

Phænomenon and Face of the Quadrant.	Date.	ARCH of 96.		Arch of 90.	Refraction or Equation applied.	Zenith Distance corrected.	Declination.	Latitude by the Observation.	Name of the Place and its correct Latitude.
	1784, April	D.S.D.N.							
α Urf. Maj.	W. 23d,	52.	3.29	° 1' "	67,0	° 49' 41.25	62.54.43	° 1' "	° 1' "
α Leonis,	W. 25th,	0.	2.09	49.39.56	0,5	0.32.40	13.00.53	13.13.18	13.15.01,5
				0.32.05				13.31.34	Arambaukum.
				Collim.					° 1' "
α Urf. Maj.	W. 26th.	52.	1.29	49.11.48,4	102	49.13.11,2	62.54.43	13.41.32,2	13.31.36
				49.12.20	67,0				Akamapett.
α Virginis,	E. 25.	1.01		23.40.45	25	23.41.17,5	10. 1.46	13.39.31,5	° 1' "
α Leonis,	W. 27th,	0.	3.10,5	0.46.48	0,8	0.46.54,8	13. 0.53	13.47.47,8	13.40.32
									Akarumpauk.
γ Leonis,	W. 28th,	7.	2.14	7. 8 01,6	7	7. 7.48,8	20.55.38	13.47.50	° 1' "
γ Leonis,	W. 28th,	7.	1.20	6.56.36	7	6.56.55		13.40.43	13.47.49
									Nayrpett.
α Virginis,	E. 25.	20.01		23.54.49	25	23.55.19	10. 1.46	13.53.33	° 1' "
α Urf. Maj.	W. 29th,	52.	0.12,5	48.50.29,6	65	48.51.45	62.54.43	14. 2.58	13.56.08
α Virginis,	E. 25.	2.25		24. 5.22	25	24. 6.01	10. 1.46	14. 4.15	Korware.
γ Leonis,	W. 30th,	7.	1. 3	6.49.07,2	6,5	6.49.15	20.55.38	14. 6.23	° 1' "
α Urf. Maj.	W. 30th,	52.	0. 9	48.48.57	65	48.50.23	62.54.43	14. 4.20	14. 5.12,6
α Virginis,	E. 25.	2.23		24. 4.29	25	24. 5.15	10. 1.46	14. 3.29	Vincateechil-
α Urf. Maj.	W. May	51.	3.04	48.32.42	64	48.33.25	62.54.43	14.21.18	lum ° 1' "
α Virginis,	E. 1st,	25.	3.26	24.19.52	26	24.20.22	10. 1.46	14.18.36	14.19.57



*Observations at large for determining the Latitudes of Places.*

Phenomenon and Face of the Quadrant.	Date.	ARCH of 96.		Equation applied.	Zenith Distance corrected.	Declination.	Latitude by the Observation.	Name of the Place and its correct Latitude.
		Reading.	Value.					
δ Urf. Maj.	1784, May	D.S.D.N. 46. 2.17	° 1' 11" 43.43. 6	" 54	° 1' 11" 43.44.27	° 1' 11" 58.13.58	° 1' 11" 14.29.31	Pinnare River
ζ Urf. Maj.	3d	44. 1.10	41.43.27,4	50,3	41.34.09	56. 3.23	N. 14.29.14	North Bank
α Virginis,		26. 0.15	24.29.05,5	26	24.29.33,7	10. 1.46	S. 14.27.47,7	° 1' 11" 14.28.35
α Virginis,	10th,	26. 2.22	25.00.17,6	26,2	25.00.55		14.59.09	Ollore*
ζ Urf. Maj.		44. 1.20	41.37.51	49	41.38.24,5	56. 3.23	N. 14.24.58,5	14.42.03,8
δ Urf. Maj.	12th,	46. 0.22	43.17.10	53	43.18.03	58.13.58	N. 14.55.55	Mooaumillo-
α Virginis.		26. 1.28	24.48.52	25	24.49.16	10. 1.48	S. 14.47.28	dooro
ζ Urf. Maj.		43. 3.15	41. 7.32	44	41. 8.35	56. 3.23	N. 14.54.48	
α Virginis,	13th,	26. 1.30	24.49.48,5	25	24.50.19,3	10. 1.48	S. 14.48.31,3	
ζ Urf. Maj.		43. 3.14	41. 7.05,5	44	41. 7.51,7	56. 3.23	N. 14.55.31,3	14.51.42,1
δ Urf. Maj.	19th,	45. 2.07	42.42.27,1	53	42.43.11,5	58.13.58	N. 15.30.46,5	Ongole, pro-
ε Urf. Maj.		44. 1.17	41.36.32	50	41.37.06	57. 8.02,5	N. 15.30.56,5	perly Wungole
α Virginis.		27. 0.22	25.28.25	27	25.29.09,5	10. 1.48	S. 15.27.21,5	
ζ Urf. Maj.		43. 0.27	40.30.37	49	40.31.22,5	56. 3.23	N. 15.32.00,5	15.29.18,2
α Virginis,	20th,	27. 1.05	25.35.01	27	25.35.27,5	10. 1.48	S. 15.33.39,5	Chicoortee
ζ Urf. Maj.		43. 0.17	40.26.13	49	40.26.58	56. 3.23	N. 15.36.25	15.35.44,5

*Observations at large for determining the Latitudes of Places.*

Phænomenon and Face of the Quadrant.	Date.	ARCH of 96.		Arch of 90.	Equalon applied.	Zenith Distance corrected.	Declination.	Latitude by the Observation.	Name of the Place and its correct Latitude.
α Virginis, E.	1784. May 22d,	D.S.D.N. 27. 1.05	° ' " 25.35.01	° ' " 25.35.00	" 27	° ' " 25.35.27.5	° ' " 10. 1.48 S.	° ' " 15.33.39.5	Yenmumbender
ζ Urf. Maj. W.		43. 0.13	40.24.29	40.25.00	49	40.25.33.4	56. 3.23 N	15.37.49.6	° ' " 15.46.27.5
α Urf. Maj. W.	23d,	36. 3.15	34.33.37	34.33.50	39	34.34.22.5	50.23.42 N.	15.49.09	Vantipollam
α Libræ, E.		32. 3.21	30.51.25	30.51.05	34	30.51.49	15. 8.03 S.	15.43.46	15.46.27.5
α Virginis, E.	25th,	27. 2.15	25.53.28	25.54.00	28	25.54.12	10. 1.48 S	15.52.24	Baupetla
ζ Urf. Maj. W.		42. 3. 3	40. 6.00	40. 5.50	48	40. 6.43	56. 3.23 N	15.56.40	15.54.32
α Urf. Maj. W.	26th,	36. 2.16	34.20.09.4	34.20.00	39	34.20.43.7	50.23.42 N	16.02.58.3	Chundole
α Libræ, E.		33. 0.20	31. 5.02	31. 5.00	34	31. 5.35	15. 8.03 S	15.57.32	16. 0.15.2 C.
α Urf. Maj. W.	28th,	36. 1.22	34. 8.44	35. 8.05	38	34. 9 02.5	50.23.42 N.	16.14.39.5	Sicacollum, on the North Bank of the Kifina
α Libræ, E.		33. 1.15	31.16.54	31.17.00	34	31.17.31	15. 8.03 S.	16. 9.28	16.12.04.3

LIEUTENANT COLEBROOKE had by this time acquired the art of using the quadrant, and his observations will appear where I did not take any. The next is his, and where his are substituted, they will be marked C. He did observe Chiccoorte, the result I had entered in my book, it was 15°. 34'. 10". but his observation was lost.

α Urf. Maj. W. 26th, 36. 2.16 34.20.09.4 34.20.00 39 34.20.43.7 50.23.42 N 16.02.58.3 Chundole  
 α Libræ, E. 33. 0.20 31. 5.02 31. 5.00 34 31. 5.35 15. 8.03 S 15.57.32 16. 0.15.2 C.  
 α Urf. Maj. W. 28th, 36. 1.22 34. 8.44 35. 8.05 38 34. 9 02.5 50.23.42 N. 16.14.39.5 Sicacollum, on the North Bank of the Kifina  
 α Libræ, E. 33. 1.15 31.16.54 31.17.00 34 31.17.31 15. 8.03 S. 16. 9.28 16.12.04.3

\* The quadrant was pulled to pieces at Pinnare Camp, and the line of collimation had not been adjusted; it was performed before it was next used.



*Observations at large for determining the Latitudes of Places.*

Phænomenon and Face of the Quadrant.	Date.	ARCH of 96.		Arch of 90.	Equation applied.	Zenith Distance corrected.	Declination.	Latitude by the Observation.	Name of the Place and its correct Latitude.
ε Urf. Maj.	1784 May 29th,	D. S. D. N.	° ' "	° ' "	' "	° ' "	° ' "	° ' "	Moodenoore
		43. 1.18	40.40.43	40.39.55	49	40.41.08	57. 8.02, 5 N	16.26.54.5	
α Virginis,	28. 0.21	26.24.14		26.23.30	29	26.24.21	10. 1.48 S.	16.22.33	
α Virginis,	28. 1.28	26.41.22		26.42.00	29	26.42.10		16.40.22	16.24.38, 8 C.
ζ Urf. Maj.	41. 3.22	39.18.16		39.18.10	48	39.19.10	56. 3.25 N.	16.44.13	Ellore
ε Urf. Maj.	43. 0.08	40.22.15, 9		40.22.20	49	40.23.07	57. 8.02, 5 N.	16.44.55, 5	16.42.17, 5 P.
η Urf. Maj.	35. 3.17	33.38.24, 5		33.38.40	37, 7	33.39.10	50.23.42 N	16.44.32	
α Libræ,	33. 3.22	31.48.06, 3		31.48.10	35	31.48.43, 2	15. 8.04 S.	16.40.39, 2	16.42.41, 5 C.
☉ Up. Limb. W.	5. 2.20	5.18.10		5.18.40	5, 0	5.34.18	22.32.32 N.	16.58.14 P	Soolaurum
				Semedia.	+				
					15, 49				
				Parallax.	—				
α Virginis,	28. 2.28	26.55.26		26.55.20	29	26.55.52	10. 1.48 S.	16.04.54 C	16.56.08, 5
α Virginis,	28. 3.02	26.58.04		26.57.05	29	26.58.03, 5		16.56.15, 5	Rajahmundry
ζ Urf. Maj.	41. 2.15, 5	39. 1.11, 2		39. 1.20	46	39. 2.01, 6	56. 3.23 N	17. 1.12, 4	16.58.43, 6 P.
α Urf. Maj.	35. 2.09	33.20.50		33.21.00	36	33.21.31	50.23.42 N.	17. 2.11	
α Libræ,	34. 0.23	32. 2.44		32. 2.40	35	32. 3.17	15. 8.04 S.	16.55.13	16.58.42 C.
α Urf. Maj.	35. 1.29	33.15.33		33.15.00	35, 5	33.15.52	50.23.42 N.	17. 7.50	Rajahnagur
β Libræ,	27. 1.07	25.35.53		25.35.00	27	25.35.53	8.34.33 S.	17. 1.20	7. 4.35 C.

Phenomenon and Face of the Quadrant.	Date.	ARCH of 96.		Arch of 90.	Equation applied.	Zenith Distance corrected.	Declination.	Longitude by the Observation.	Name of the Place and its correct Latitude.
	1784. June	D.S.D.N.							
* Urf. Maj.	14th,	35. 1.29	33.15.33.5	33.15.55	37	33.16.21	50.23.42	17. 7.21	Peddapore
α Draconis,		51. 2.00	48.16.52.5	48.16.10	62.7	48.17.34	65.24.36	17. 7.02	
α Libræ,		34. 1.18	32.10.05	32. 9.30	34.5	32.10.22	15. 8.04	17. 2.18	° / "
β Libræ,		27. 1.07	25.35.53.3	25.34.40	25.4	25.36.12	8.34.33	17. 1.39	17. 4.35 P
β Scorpii,	18th,	38. 2.20	36.14.25	26.13.40	41.5	36.14.44	19.12.01.6	17. 2.42	
γ Draconis,		36. 2.24	34.23.40	34.24.00	39.0	34.24.29	51.31.18	17. 6.49	17. 4.45.5 C.
α Virginis,	20th,	28. 3.27	27. 8.59.7	27. 8.30	29.0	27. 9.13.7	10. 1.48	17. 7.26	Gooloopool-loore,
β Libræ,		27. 1.19	25.41.09.7	25.41.30	28.0	25.41.48	8.34.33	17. 7.15	
ζ Urf. Maj.		41. 1.30	38.53.30	38.53.20	44.0	38.54.09	56. 3.33	17. 9.05	17. 8.35.5 C
* Urf. Maj.		35. 1.23	33.12.55.2	33.12.50	37	33.13.15	50.23.42	17.10.27	Ronding and Mator.
* Urf. Maj.	21st,	35. 1.16	33. 9.50.6	33. 9.20	37	33.10.12	50.23.42	17.13.30	17.12.45 C.
α Libræ,		34. 1.39	32.19.18	32.20.00	35	32.20.14	58.18.04	17.12.10	Suteawaurum
β Libræ,	22d,	27. 2.10	25.51.16	25.50.20	28	25.53.06	8.34.33	17.18.33	
					+				
		From 18th to 20th		June Col.	1.50				17.18.33 C.
α Coronæ Borealis,	24th,	10. 2.02	9 51.30	9.50.40	10	9.51.15	27.27.03.5	17.35.48.5	Ellmuchille
β Scorpii,		39. 0.19	36.42.06	36.41.50	43	36.42.41	19.12.01.6	17.30.39.4	17.33.14 C.



*Observations at large for determining the Latitudes of Places.*

Phenomenon and Face of the Quadrant.	Date.	ARCH of 96.		Arch of 90.	Equation applied.	Zenith Distance corrected.	Declination.	Latitude by the Observation.	Name of the Place and its correct Latitude.
$\alpha$ Coronæ Borealis,	1784. June 27th,	D.S.D.N. 10. 1.08	° ' " 9.40.04,7	° ' " 9.39.40	' " 9,6	° ' " 9.40.02	° ' " 27.27.03,5 N.	° ' " 17.47.01,5	Sobaurum
$\beta$ Scorpii,	July 9th,	39. 1.23,5	36.58.08,4	30.57.20	43	36.58.27,2	19.12.02	17.46.25,2	° ' " 17 46.59,2 C.
$\alpha$ Scorpii,	12th,	46. 2.11	43.40.27,6	43.41.00	55	43.41.39	25.56.12	17.45.27	These were made with difficulty amongst clouds & winds, but they were all that could be had.
☉ Up. Limb W.		5.04.12	3.50.16,4	3.50.00	3,6	4. 5.59	27.55.02	17.49.03	Vizacpatam
$\alpha$ Lyrae,	Sept. 8th,	22.00.29	20.50.14	20.49.40	15,47	20.50.30	38.35.26,3 N.	17.44.56,3	
$\beta$ Lyrae,		16.01.20	15.22.51	15.22.10	33	15.22.45,5	33.07.16	17.44.30,5	
$\alpha$ Aquilæ,		9.03.27	9.20.18,2	9.20.00	15	9.20.18,1	8.18.32,5 N.	17.38.50,6	
$\beta$ Aquilæ,		12.02.05,5	11.45.33	11.45.10	9	11.45.34	5.53.08,3 N.	17.38.42,3	17.41.45
$\alpha$ Coronæ Borealis,	July 14th,	10. 0.16	9.29.32	9.28.50	12	9.29.20,5	27.27.03,5 N.	17.57.43,0	Beemulwilfa Camp, A clear Night.
$\gamma$ Draconis,		35. 3.07	33.34 01	33.33.10	9,5	33.34.13	51.31.18	17.57.05	
$\alpha$ Scorpii,		39. 2.03	37. 3.11	37. 2.40	37,5	37. 3.38,5	19.12.02	17.51.36,5	17.54.15 C.
$\beta$ Scorpii,		46. 2.23	43.45.44	43.46.00	43	43.46.47	25.56.12	17.50.35	Simachillum
$\beta$ Libræ,		28. 0.08	26.18.31	26.19.00	55	26.19.14	8.34.33	17.44.41	
$\alpha$ Coronæ Borealis,					20,5				
8th,		10. 1.05,5	9 38.59	9.38.40	9,5	9.38.59,0	27.27.03,5 N.	17.48.04,5	17.46.28,8 C.

of the stars in the sky for about measuring the latitudes of India.

The four following Observations were taken by a Quadrant made by RAMSDEN, eighteen inches radius, which shewed Altitudes.

Phænomenon and Face of the Quadrant.	Date.	ARCH of 96.		Arch of 90.	Equation applied.	Zenith Distance corrected.	Declination.	Latitude by the Observation.	Name of the Place and its correct Latitude.
	1784.	D.S.D.N.	° ' "	° ' "		° ' "	° ' "	° ' "	
α Lyrae,	Aug. 29th,	73. 3.10	69.17.13.6	69.17.35	-22	69.17.02.3	38 35.26,1 N.	17.52.28,4	Beemulwila,
β Lyrae,		79.03.00.9	74.45.47.3	74.46. 0	-15,6	74.45.38	33 07.16 N.	17.52.54,0	Head Quarters,
α Aquilæ*,		85.03. 2	80.24.24	80.24.50	-10	80.24.27	8.18.32 N.	17.54. 5	° ' "
β Aquilæ†,		83.00.12	77.58.32	77.58.47	-12	77.58.28	5.53.08 N.	17.54.40	17.53,32 P
α Draconis,	8th,	35 03.11	33.35.46,3	33.35.00	38	33 36.01	51.31.18 N.	17.55.17	
α Lyrae,		22.00.04	20.39.16	20.38.30	20	20.39.13	38.35.26 N.	17.56.13	
α Lyrae,	9th,	22.00.05	20.39.42	20.39.00	20	29 39.41		17.55.45	
* Sagitarii,		55 03.08	52.19.27,3	52.18.50	75	52.20.18,6	34.27 59,5 S.	17.52.29	
α Aquilæ,	28th,	10.00 23,5	9.32.50	9.33.00	10	9 33.05	8.18.32,5 N.	17.51.37,5	
† Sagitarii,	31st,	55.03.07	52.19.01	52.18.40	75	52.20.06	34.27 59,5 S.	17.52.06,5	
α Lyrae,		22.00.06	20.40.09	20.39.30	20	20.40.15	38.35.26 N.	17.55.11	
α Cygni,	Sept.	38.01.13	26.34.46,6	26.35.00	29	26.35.22	44.31.05,3 N.	17.55.43,3	
β Aquarii,		25.03.30	24.21.37,8	24.22.00	25	24.22.14	6.30.33 S	17.51.41	
α Cephei	3d,	46.02.22	43.45.17,3	43.45.00	55	43.46.04	61.40.42 N.	17.54.38	
β Aquarii,	27th,	26.00.00	24.20.30	24.22.20	25	24.22.50	6.30.33 S.	17.52.17	
6 North. Stars,								17.55.28	
6 South. Stars,								17.52.14	

\* From the reading of α Aquilæ, 29th August, subtract 48", † and from β Aquilæ 45".

Head Quarters, Cantonments at Beemulwila, C.  
The mean 17.53.51



# *Observations at large for determining the Latitudes of Places.*

From henceforward all the Observations were taken by Lieutenant COLEROCKE.

Phenomenon and Face of the Quadrant.	Date.	ARCH of 96.		Arch of 90.	Equation applied.	Zenith Distance corrected.	Declination.	Latitude by the Observation.	Name of the Place and its correct Latitude.
	1784								
	Oct.	D. S. D. N.							
W. $\alpha$ Cephei,	22d,	46.01.24	° 43.32.06,8	° 43.31.30	" 53	43.32.42,3	° 61.40.42,2 N.	° 18.08.00	Vizianagur Pa-
E. $\beta$ Aquarii,		26.00.26	24.33.55,6	24.33.30	26	24.34.08,8	6.30.33 S.	18.03.35,8	lace,
W. $\alpha$ Cygni,	23d,	28.00.15,8	26.21.35,5	26.22.00	28	26.22.15,8	44.31.05,3 N.	18.08.49,6	
W. $\alpha$ Cephei,		46.01.25	43.32.32,9	43.31.46	54	43.33.03,5	° 61.40.42,2 N.	° 18.07.38,7	
E. $\beta$ Aquarii,		26.00.26	24.33.55,6	24.33.35	26	24.34.11,3	6.30.33 S.	18.03.38,3	"
W. $\alpha$ Cygni,	25th,	28.00.27	26.26.51,9	26.27.00	28	26.27.24	44.31.05,2 N.	18.03.41,2	18.05.52,3
W. $\alpha$ Cephei,		46.02.00	43.36.30,2	43.35.50	54	43.37.04,1	° 61.40.42,2 N.	° 18.03.38,1	Brimfing,
E. $\beta$ Aquarii,		26.00.19	24.30.51	24.30.00	26	24.30.51,5	6.30.33 S.	18.00.18,0	18.01.59
W. 7 Lacertæ,	26th,	33.01.23	31.20.25,2	31.20.00	34.4	31.20.47	49.10.48 N.	17.51.01	Santipollum,
E. Fumulothoot,		51.03.07	48.34.00,8	48.33.30	64	48.34.49,5	30.45.25,6 S.	17.49.23,8	17.49.42,4
W. $\alpha$ Cephei,	31st,	46.02.00	43.35.37,5	43.35.00	54	43.36.13	61.40.42,2 N.	18.05.29,2	Chintulwilfa,
E. $\beta$ Aquarii,		26.00.18	24.30.24,6	24.30.00	25,7	24.30.38	6.30.33 S.	18.00.05	18.02.17,1
W. Nov.	Nov.	46.01.26	43.32.59,3	43.32.50	54	43.33.48,6	61.40.42,2 N.	18.06.53,6	Narrainpoore,
E. 1st,		26.00.23	24.32.36,5	24.32.20	26	24.32.54,3	6.30.33 S.	18.02.21,3	
E. Fumulothoot,		52.00.08	48.48.30,9	48.48.30	65	48.49.35,5	30.45.25,6 S.	18.04.08,9	
W. $\beta$ Cassiopææ,		42.01.29	39.49.18,4	39.49.00	48	39.49.57,2	57.57.50 N.	18.07.52,8	18.05.18,7
E. $\alpha$ Aquarii,	3d,	20.02.26	19.24.33,5	19.24.00	20	19.24.36,8	1.21.30,6 S.	18.03.06,2	Kundalwilfa.
W. 7 Lacertæ,		33.00.11	31.01.05,1	31.01.30	34	31.01.51,6	49.10.48 N.	18.08.56,4	18.06.01,3

## Observations at large for determining the Latitudes of Places.

Phænomenon and Face of the Quadrant.	Date.	ARCH of 96.		Arch of 90.	Equation applied.	Zenith Distance corrected.	Declination.	Latitude by the Observation.	Name of the Place and its correct Latitude.
	1784.								
7 Lacertæ, W.	Nov. 4th,	D.S.D.N.	° ' "	° ' "	"	° ' "	° ' "	° ' "	° ' "
α Andromedis, W.	5th,	33.00.00	30.56.15	30.55.20	34	30.56.21,5	49.10.48 N.	18.14.26,5	18.12.24,2 Sicacole Camp,
γ Pegafi, E.	5th,	10.00.27	9.34.22	9.34.20	10	9.34.31	27.53.56 N.	18.19.25.	18.17.01
α Cephei, W.	7th,	4.02.06	4.15.45,7	4.15.00	4	4.15.27	13.59.10 N.	18.14.37	18.17.01
μ Fumalhoot, E.	7th,	46.00.21	43.16.43,7	43.17.00	53	43.17.45	61.40.42,2 N.	18.22.57,2	Kalingapatam Camp,
μ Fumalhoot, E.	9th,	52.01.11	49.03.54	49.04.00	65	49.05.02	30.45.25,6 S.	18.19.36,4	18.21.16,8
α Andromedis, W.	9th,	52.08.28	49.11.22,1	49.11.20	64	49.12.25		18.26.59,4	Kulliparoo,
γ Pegafi, E.		10.00.02	9.23.22,4	9.23.30	10	9.23.36	27.53.53 N.	18.30.17	
α Andromedis, W.		4.03.02	4.28.04	4.27.30	5	4.27.25	13.59.07 N.	18.26.59	18.28.39 Coffeboogaum,
γ Pegafi, E.	11th,	9.02.27	9.06.14,5	9.05.40	10	9.06.07	27.53.53 N.	18.47.46	
μ Fumalhoot, E.	14th,	5.00.05	4.43.27	4.43.0	4,5	4.43.18	13.59.07,5 N.	18.42.25,5	18.45.05,8
β Calliopææ, W.		53.00.10	49.45.38,7	49.45.30	67	49.46.41,4	30.45.22,5 S.	19.01.19	Kutwaul Tau- laub,
		41.01.28	38.52.37,1	38.52.00	56	38.53.04,6	57.57.46,7 N.	19.04.42,1	19.03.00,5



*Observations at large for determining the Latitudes of Places.*

Phenomenon and Face of the Quadrant.	Date.	ARCH of 96. Reading.	Value.	Arch of 93.	Equation applied.	Zenith Distance corrected.	Declination.	Latitude by the Observation.	Name of the Place and its correct Latitude.
$\alpha$ Andromedis, W.	1784. Nov. 15th,	D. S. D. N. 9.01.10	8.44.42,5	8.45.00	" 8,7	8.45.00	27.53.59	19.08.59	Ichapoor, ° / "
$\gamma$ Pegasi, E.		5.01.23	5.05.25,3	5.05.00	5	5.05.17,5	13.59.13,3	19.04.30,8	° / "
7 Lacertæ, W.	16th,	31.03.10	29.50.20	29.49.40	33	29.50.33	49.10.45	19.20.12	19.06.45
Fumulhoot, E.		53.01.15	50.01.54,3	50.02.00	67	50.03.04,2	30.45.22,5	19.17.41,7	Burrampore, ° / "
7 Lacertæ, W.	17th,	31.03.13	29.51.39,1	29.51.00	33	29.51.52,6	49.10.45	19.18.57	19.18.57
Fumulhoot, E.		53.01.10	49.59.40,4	49.59.30	67	50.00.42,2	30.45.22,5	19.15.19,7	Munsoor Cottah, ° / "
	18th,	53.01.24	50.05.51,6	50.05.30	67	50.06.48	57.57.53	19.21.25,5	19.17.05,5
$\beta$ Cassiopææ, W.		41.00.03	38.31.58	38.31.00	46	38.32.15	30.45.22,5	19.25.38	Ganjam Camp, ° / "
Fumulhoot, E.	25th,	53.02.06	50.12.00,7	50.12.00	67	50. 3.07,5	30.45.22,5	19.27.45	19.23.32
$\beta$ Cassiopææ, W.		41.00.03	38.27.34,7	38.26.50	45,6	38.27.58	57.57.50,0	19.29.55	Piaghee, ° / "
Fumulhoot, E.	26th,	43.02.14	50.15.31,7	50.15.30	67	50.16.38	30.45.22,5	19.31.15,5	19.28.50
$\beta$ Cassiopææ, W.		40.03.25	38.23.11	38.23.10	45,6	38.23.56	57.57.53	19.33.57	Maloodée, ° / "
Fumulhoot, E.	29th,	53.03.04	50.25.11,8	50.24.40	67	50.26.02	30.45.22,5	19.40.40,5	19.32.36,5
$\alpha$ Andromedis, W.		8.02.29	8.10.52,2	8.10.50	8	8.10.59,1	27.53.59,0	19.43.00	Manickpatam, ° / "

## Observations at large for determining the Latitudes of Places.

Phænomenon and Face of the Quadrant.	Date.	ARCH of 96.		Arch of 90.	Equation applied.	Zenith Distance corrected.	Declination.	Latitude by the Observation.	Name of the Place and its correct Latitude.
	1784.								
	Nov.	D. S. D. N.							
α Cassiopææ, W.	29th,	38.00.01	° / "	35.37.56,4	40,8	° / "	55.21.23.0	° / "	° / "
μ Fumulooot, E.	Dec.	53.03.21		50.32.40	67	35.38.24	30.45.22.5 S.	19.42.59	19.41.50
γ Pegasi, E.	4th,	6.00.21		5.46.43,7	6	50.32.42	13.59.13.3 S.	19.48.19.5	Jaggernaut,
α Cassiopææ, W.		37.03.22		35.33.06,3	41	5.46.43	55.21.23 N.	19.45.56,3	
α Andromedis, W.		8.02.12		8.03.26	8	35.33.34,2	27.53.59	19.47.49	
α Andromedis, W.	7th,	8.01.21		7.53.17,5	8	8.03.21		19.50.38	19.41.50
α Cassiopææ, W.		37.02.26		35.20.48	40	7.53.27	27.53.59	20.00.32	Ahmetpoore,
ε Cassiopææ, W.		45.01.24		42.35.52	52	35.21.34	55.21.23	19.59.49	
γ Pegasi, E.		6.01.06		5.54.12	6	42.36.44	62.36.07	19.59.23	
η Ceti, E.		33.01.05		31.12.30,7	34	5.54.12	13.59.13.3 N.	19.53.25.3	
θ Ceti, E.		31.00.17		29.11.13,3	32	31.12.49,4	11.19.35	19.53.14.4	
α Cassiopææ, W.		37.02.05		35.11.34,3	40	29.11.23,6	9.17.47	19.53.36,6	19.56.40,2
α Cassiopææ, W.	8th,	41.02.07		38.57.27,1	46	35.11.57	55.21.23	20.09.26	Peeply,
η Ceti, E.		33.02.00		31.24.22,6	34,4	38.57.59,6	59.06.56	20.08.56	
α Andromedis, W.	9th,	8.00.08		7.33.31	6	31.24.46	11.19.35	20.05.11	20.07.11
γ Pegasi, E.		6.02.22		6.15.18	7,5	31.24.46			
						7.33.23	27.53.59	20.20.36	Ballunta
						6.15.30	13.59.13	20.14.43	20.17.40



*Observations at large for determining the Latitudes of Places.*

ARCH of 96.									
Phænomenon and Face of the Quadrant.	Date.	Reading.	Value.	Arch of 90.	Equation applied.	Zenith Distance corrected.	Declination.	Latitude by the Observation.	Name of the Place and its correct Latitude.
$\gamma$ Cassiopææ, W.	1784, Dec. 10th,	D. S. D. N. 41.02.22	° ' " 39.04.02,6	° ' " 39.03.30	" 46	° ' " 39.04.30	° ' " 59.52.54 N.	° ' " 20.28.21,7	Sowlagunda, near Kuttack,
$\eta$ Ceti, E.		33.03.13	31.43.59	31.43.30	35	31.44.20	11.19.35	20.24.45	° ' " 20.26.33,5
$\epsilon$ Cassiopææ, W.	15th.	44.02.16	41.50.09,4	41.49.40	51	41.50.45,7	62.36.07	20.45.21,3	Koonereah River, north side,
$\alpha$ Piscium, E.		20.00.29	18.57.44,7	18.57.40	19	18.58.01,4	1.43.03	20.41.04,4	° ' " 20.43.13
$\alpha$ Cassiopææ, W.	17th,	36.02.20	34.26.18,5	34.26.00	39	34.26.48,3	55.21.23	20.54.34,7	Jehaujeepoor River, N. side,
$\eta$ Ceti, E.		34.01.04	32.18.19,3	32.08.20	35	32.08.55	11.19.35	20.49.20	° ' " 20.51.57
$\gamma$ Cassiopææ, W.	19th,	41.00.15	38.32.50,5	38.32.30	45	38.33.25,3	59.32.54	20.59.28,7	Chorakootee,
$\delta$ Cassiopææ, W.		40.02.18	38.06.02,1	38.05.30	44	38.06.30	59.06.56	21.00.26	
$\theta$ Ceti, E.		32.01.04	30.15.49,3	30.15.20	33,3	30.16.08	9.17.47	20.58.21	° ' " 20.59.09
$\beta$ Cassiopææ, W.	20th,	44.00.29	31.27.44,7	31.27.30	50	41.28.27,4	62.36.07	21.07.40,4	Raneeka Taulaub
$\delta$ Ceti, E.		23.00.29	21.42.06	21.42.00	22	21.42.25	0.36.32	21.05.53	° ' " 21.06.46
$\alpha$ Cassiopææ, W.	21st,	36.01.15	34.05.39,3	34.05.20	38	34.06.08	55.21.23	21.15.15	Kaunfe Baunfe,
$\delta$ Cassiopææ, W.		40.01.16	37.51.05,7	37.51.00	44	37.51.47	59.06.56	21.15.09	
$\eta$ Ceti, E.		34.02.24	32.31.10,3	32.30.40	36	32.31.31,2	11.19.35	21.11.56,2	° ' " 21.13.52,3
$\theta$ Ceti, E.		32.02.06	30.30.45,7	30.30.20	33	30.31.06	9.17.47	21.13.19	° ' " 21.15.13,5
$\alpha$ Cassiopææ, W.	22d,	36.00.24	33.55.33	33.55.30	38	33.56.09,5	55.21.23	21.25.13,5	Aymnulla,
$\eta$ Ceti, E.		34.03.12	32.39.57,3	32.39.40	35,4	32.40.24	11.19.35	21.20.49,0	° ' " 21.23.01,2
$\epsilon$ Cassiopææ, W.	23d,	43.02.24	40.57.05,4	40.57.00	40,3	40.57.52	62.36.07	21.38.14,3	Daumduroor.

*Observations at large for determining the Latitudes of Places.*

Phenomenon and Face of the Quadrant.	Date.	ARCH of 96.		Arch of 90.	Equation applied.	Zenith Distance corrected.	Declination.	Latitude by the Observation.	Name of the Place and its correct Latitude.
$\gamma$ Andromel's,	1784. Dec.	D.S.D.N.	° ' "	° ' "	"	° ' "	° ' "	° ' "	
W.	23d,	20.03.25	19.38.10,5	19.37.40	21,8	19.38.17	41.17.22	21.39.5,0	
$\alpha$ Piscium,	E.	21.00.24	19.51.48	19.51.00	21	19.51.45	1.43.03	21.34.48,0	° ' "
$\delta$ Ceti,	E.	23.02.18	22.09.47,2	22.10.00	22,4	22.10.16	0.36.32,0	21.33.44,0	21.36.38
$\epsilon$ Cassiopææ,	W.	43.02.06	40.49.10,8	40.49.00	49	40.19.54,4	62.36.07	21.46.12,6	Soobanreka Ri- ver, at Rauje Gaut, on the Ballafore side,
$\delta$ Ceti,	E.	23.03.09	22.19.54	22.19.30	22	22.20.04	0.36.32	21.43.32,0	
$\epsilon$ Cassiopææ,	W.	43.01.30	40.46.10	40.46.00	49	40.46.54	62.36.07	21.49.13,0	
$\epsilon$ Eridani,	E.	34.00.06	31.55.08	31.55.08	35	31.55.43	10.13.26,6	21.42.16,4	21.45.18,5
$\delta$ Cassiopææ,	W.	39.03.02	37.16.49	37.16.00	48	37.17.13	59.06.56	21.49.43	Jellafore Camp
$\delta$ Ceti,	E.	23.03.10	22.20.20	22.20.00	24	22.20.34	0.36.32	21.44.02	21.46.53
$\eta$ Ceti,	E.	35.01.27	33.14.40,6	33.14.00	38	33.14.58,3	11.19.35	21.55.23,3	Dantoon Camp
$\delta$ Cassiopææ,	W.	39.02.11	37.06.32,5	37.06.00	43	37.06.59,3	59.06.56	21.59.56,7	21.57.40



*Observations at large for determining the Latitudes of Places.*

Phænomenon and Face of the Quadrant.	Date.	ARCH of 96.		Arch of 90.	Equation applied.	Zenith Distance corrected.	Declination.	Latitude by the Observation.	Name of the Place and its correct Latitude.
	1784.								
γ Cassiopææ, W.	Dec. 29th,	D.S.D.N.	° ' "	° ' "	"	° ' "	° ' "	° ' "	Khutnagur,
η Ceti, E.		39.03.21	37.25.10	37.24.40	42	37.25.37	59 32.55.5 N.	22.07.18	° ' "
γ Cassiopææ, W.	30th,	35.02.06	33 19.30,6	33.19.10	37	33.19.57,3	11.19.35 S.	22.00.22	22.03.50
		39.03.02	37.16.49	37.16.30	42	37.17.22	59.32.55.5 N.	22.15.33,5	Mokurum.
δ Cassiopææ, W.		39.01.08	36.51.19,7	36.50.40	43	36.51.43	59.06.56 N.	22.15.13	poor,
η Ceti, E.		35.02.27,5	33.28.57,5	33.28.20	37	33.29.16	11.19.35 S.	22.09.41	22.12.32,1
γ Persei, W.	31st,	32.00.29	30.12 44,7	30.13.00	33	30.13.25,4	52.37 59 N.	22.24.33,6	Kaffai River,
β Persei, W.		18.03.14	17.40.50,4	17.40.30	18	17.40.58,2	40.06.50 N.	22.25.51,8	
δ Ceti, E.		24.01.26	22.55.29,3	22 55.00	24	22.55.39	00.36.32 S.	22.19 07	
12 Eridani, E.	Jan. 4th,	55.02.16	52.08.54,5	52.09.10	73	52.10.15,3	29.51.02 S.	22.19.13,3	22.22.11,3
δ Cassiopææ, W.		39.00.10	36.38.08,7	36.37.40	42	36.38.36,3	59.06.56 S.	22.28.19,7	Midnapoor Fort,
ε Cassiopææ, W.		42.03.07	40.07.46	40.07.30	48	40.08.26	62.36.07 N.	22.27.41	
δ Ceti, E.		24.02.00	22.58.07,5	22.58.00	24	22.58.48	00.36.32 S.	22.22.16	22.25.08,3

Observations at large for determining the Latitudes of Places.

Phænomenon and Face of the Quadrant.	Date.	ARCH of 96.		Equation applied.	Zenith Distance corrected.	Declination.	Latitude by the Observation.	Name of the Place and its correct Latitude.
	1784. Jan. 5th,	D.S.D.N.	° ' "	"	° ' "	° ' "		
♂ Cassiopææ, W.	5th,	42.03.05	40.06.53	48	40.07.15	62.36.07 N.	22.28.52	Bunpoor,
♂ Ceti, E		24.02.06	23.00.46	24	23.01.02	00.36.32 S.	22.24.30	° ' "
♂ Cassiopææ, W.	6th,	38.03.12	36.24.57,7	43	36.25.42	59.06.56 N.	22.41.14	22.26.41
12 Eridani, E		55.03.22	52.25.36,4	75	52.26.48,2	29.51.02 S.	22.35.46,2	Narraindeowul,
γ Persei, W.	7th,	31.03.09	29.49.53,6	33	29.50.10	52.37.59 N.	22.47.49	22.38.30
12 Eridani, E		56.00.10	52.34.24	74	52.35.46	29.51.02 S.	22.44.44	Madapoor,
γ Persei, W.	8th,	31.03.05	29.48.03	33	29.48.32	52.37.59 N.	22.49.27	22.46.16,5
12 Eridani, E		56.00.09	52.34.11	74	52.35.20	29.51.02 S.	22.44.18	Chunderbund,
γ Persei, W.	10th,	32.00.03	30.01.19,8	33	30.01.42,5	52.37.39 N.	22.36.16,5	22.46.52,5
12 Eridani, E		55.03.14	52.22.05,4	74	52.33.21,7	29.51.02 S.	22.32.19,7	Habra Gaut,
								22.34.18,1

Mr. Burrows published, in the Lady's Diary, a Theorem similar to mine, page 71: he shewed it to me last year. My original Book of Observations convinced him, that his Publication could not have been known to me when I wrote the Theorem.















*[The text in this block is extremely faint and illegible due to extreme fading or bleed-through from the reverse side of the page.]*



## III.

## A ROYAL GRANT OF LAND,

ENGRAVED ON A COPPER-PLATE, BEARING DATE  
 TWENTY-THREE YEARS BEFORE CHRIST; AND  
 DISCOVERED AMONG THE

## RUINS AT MONGUEER.

*Translated from the Original Sanscrit,*

By CHARLES WILKINS, Esq.

In the Year 1781.

DEB PAAL DEB.\*

PROSPERITY!

**H**IS wishes are accomplished. His heart is steadfast in the cause of others. He walks in the paths of virtue. May the achievements of this fortunate Prince cause innumerable blessings to his People!

By displaying the strength of his genius, he hath discovered the road to all human acquirements; for being a *Soogot* (1) he is Lord of the Universe.

*Gopaal*, King of the World, possessed matchless good Fortune: he was Lord of two Brides; the Earth and her Wealth. By comparison of the learned, he was likened unto *Preetoo* (2,) *Sogor* (3,) and others, and it is credited.

When his innumerable army marched, the heavens were so filled with the dust of their feet, that the birds of the air could rest upon it.

L 2

He

\* In this translation the *Sanscrit* names are written as they are pronounced in *Bengal*; but in the following paper, the translator has adopted the more elegant pronunciation of *Varanes* and *Cashmir*.



He acted according to what is written in the *Shaastra*, (1,) and obliged the different sects to conform to their proper tenets. He was blessed with a son, *Dhormo Paal*, when he became independent of his forefathers, who are in heaven.

His elephants moved like walking mountains ; and the earth, oppressed by their weight, and mouldered into dust, found refuge in the peaceful heavens.

He went to extirpate the wicked, and plant the good ; and happily his salvation was effected at the same time : for his servants visited *Kedaar*, (2,) and drank milk according to the law : and they offered up their vows where the Ganges joins the Ocean, and at *Gokornaa*, (3,) and other places, (4).

When he had completed his conquests, he released all the rebellious Princes he had made captive ; and each returning to his own country laden with presents, reflected upon this generous deed, and longed to see him again ; as mortals, remembering a pre-existence, wish to return to the realms of light.

This Prince took the hand of the daughter of *Porobol*, Raajaa of many countries, whose name was *Ronnaa Debee* ; and he became settled.

The people, being amazed at her beauty, formed different opinions of her. Some said it was *Lockee* (5) herself in her shape ; others, that the earth had assumed her form : many said it was the Raajaa's fame and reputation ; and others, that a household goddess had entered his palace. And her wisdom and virtue set her above all the ladies of the court.

This

This virtuous and praise-worthy Princess bore a son, *Deb Paal Deb*, as the shell of the ocean produces the pearl ;

In whose heart there is no impurity ; of few words, and gentle manners ; and who peaceably inherited the kingdom of his father, as *Bodheesotwo* (1) succeeded *Soogot*.

He who, marching through many countries making conquests, arrived with his elephants in the forests of the mountains of *Beendhyo*, (2,) where seeing again their long-lost families, they mixed their mutual tears ; and who going to subdue other Princes, his young horses meeting their females at *Komboge*, (3,) they mutually neighed for joy.

He who has opened again the road of liberality, which was first marked out in the *Kreto Joog* (4) by *Bolee*, (5,) in which *Bhaargob* (6) walked in the *Treetaa Joog*, (7,) which was cleansed by *Korno* (8) in the *Dwapor Joog*, (9,) and was again choaked up in the *Kolee Joog* (10) after the death of *Sokodweesee* (11.)

He who conquered the earth from the source of the Ganges as far as the well-known bridge which was constructed by the enemy of *Dosaasyo* (12,) from the River of *Luckecool* (13) as far as the ocean of the habitation of *Boroon*, (14.)

At *Mood-go-gheeree*, (15,) where is encamped his victorious army, across whose river a bridge of boats is constructed for a road, which is mistaken for a chain of mountains, where immense herds of elephants, like thick black clouds, so darken the face of day, that people think it the season of the rains ; whither the Princes of the North send so many troops of horse, that the dust of  
their



their hoofs spreads darkness on all sides; whither so many mighty Chiefs of *Jumboodweep* (1) resort to pay their respects, that the earth sinks beneath the weight of the feet of their attendants. There *Deb Paal Deb* (who, walking in the footsteps of the mighty Lord of the great *Soogots*, the great Commander, *Raajaa* of *Mohaa Raajaas*, *Dhormo Paal Deb*, is himself mighty Lord of the great *Soogots*, a great Commander, and *Raajaa* of *Mohaa Raajaas*) issues his commands. To all the inhabitants of the town of *Meseeka*, situated in *Kreemeelaa*, in the province of *Sree Nogor* (2,) which is my own property, and which is not divided by any land belonging to another; to all *Raanok* and *Kaaje-pootro*; to the (3) *Omaatyo*, *Mohaa-kaarttaa-kreeteeko*, *Mohaa-Don-do-Nayk*, *Mohaa Proteehaar*, *Mohaa-Saamont*, *Mohaa-Dow-Saadhon-Saadhoneeko*, *Mohaa-Koomaaraa-Matyo*; to the *Promaatree* and *Sorobhongo*; to the *Raajostaaneeyo*, *Ooporeeko*, *Daasaaporaadheeko*, *Chowrod-dhoroneeko*, *Daandeeke*, *Dondopaaseeko*, *Sowl-keeko*, *Gowlmeeko*, *Kyotropo*, *Praantopaalo*, *Kothtopaalo* and *Kaandaarokyo*; to the *Todaajooktoko* and the *Beeneejooktoko*; to the keeper of the elephants, horses, and camels; to the keeper of the mares, colts, cows, buffaloes, sheep, and goats; to the *Dootoprysonneeko*, *Gomaa-Gomeeko*, and *Obheetworomaano*; to the *Beesoy-potee*, *Toropotee*, and *Toreeko*. To the different tribes, *Gowr*, *Maalob*, *Khoso*, *Hoon*, *Koleeko*, *Kornaato*, *Laa-saato*, and *Bhoto*; to all others of our subjects, who are not here specified; and to the inhabitants of the neighbouring villages, from the *Braahmon* and fathers of large families, to the tribes of *Medo Ondhoroko*, and *Chondaalo*.

Be it known that I have given the above-mentioned town of *Meseeka*, whose limits include the fields where the cattle graze, above and below the surface, with all the lands belonging to it; together with all the *Mango* and *Modhoo* trees; all its waters, and all their banks and verdure; all its rents and tolls, with all fines for crimes,

and rewards for catching thieves. In it there shall be no molestation, no passage for troops; nor shall any one take from it the smallest part. I give likewise every thing that has been possessed by the servants of the Raaja. I give the Earth and Sky, as long as the Sun and Moon shall last. Except, however, such lands as have been given to God, and to the *Braahmons*, which they have long possessed, and now enjoy. And that the glory of my father and mother, and my own fame, may be increased, I have caused this *Saason* (1) to be engraved, and granted unto the great *Botho Beehkoraato Meefro*, who has acquired all the wisdom of books, and has studied the *Beads* (2) under *Oslaayono*; who is descended from *Owpomonyobo*; who is the son of the learned and immaculate *Botho Boraahoraato*; and whose grandfather was *Botho Beefworaato*, learned in the *Beads*, and expert in performing the *Jog* (3).

Know all the aforesaid, that as bestowing is meritorious, so taking away deserves punishment; wherefore leave it as I have granted it. Let all his neighbours, and those who till the land, be obedient to my commands. What you have formerly been accustomed to perform and pay, do it unto him in all things. Dated in the 33d *Sombot* (4,) and 21st day of the month of *Maargo*.

Thus speak the following *Slokes* (5) from *Dhormo Onoosaaason*:

1. “ *Rám* hath required, from time to time, of all  
“ the Raajaas that may reign, that the bridge of  
“ their beneficence be the same, and that they do con-  
“ tinually repair it.

2. “ Lands have been granted by *Sogor*, and many  
“ other Raajaas; and the fame of their deeds devolves  
“ to their successors.

3. “ He



3. "He who dispossesses any one of his property,  
"which I myself, or others, have given, may he, be-  
"coming a worm, grow rotten in ordure with his  
"forefathers!

4. "Riches, and the life of man, are as transient as  
"drops of water upon a leaf of the lotus. Learn-  
"ing this truth, O man! do not attempt to deprive  
"another of his reputation."

The Raajaa, for the public good, hath appointed his  
virtuous son, *Raajyo Paal*, to the dignity of *Jowbo*  
*Raajaa*. He is in both lines of descent illustrious,  
and hath acquired all the knowledge of his father,

## NOTES.

Page 123. (1) *Soogot* signifies an atheist, or follower of the tenets of *Soogot*, a philosopher, who is said to have flourished at a place called *Keekot*, in the province of *Behar*, one thousand years after the commencement of the *Kolee Joog*, or *Iron Age*; of which this is the 4882d year. He believed in visible things only, or such as may be deduced from effects the cause of which is known; as from smoke the existence of fire. He wrote many books to prove the absurdity of the religion of the *Brahmans*; and some upon astronomy, and other sciences, all which are said to be now in being. He further held that all our actions are attended by their own rewards and punishments in this life; and that all animals, having an equal right to existence with man, they should not be killed either for sport or food.

(2) *Pretoo* was the son of *Benó*, and *Raajaa* of a place called *Beetoor*, near *Lucknow*. He flourished in the first age of the world, and is said to have levelled the earth; and, having prepared it for cultivation, obliged the people to live in society.

(3) *Sogor*, the name of a *Raajaa* who lived in the second age at *Ojoodho*, and is said to have dug the rivers.

Page 124. (1) *Shaastra*—book of divine ordinations. The word is derived from a root signifying to command.

(2) *Kedaar*—a famous place, situated to the north of *Hindustan*, visited, to this day, on account of its supposed sanctity.

(3) *Gokornaa*—a place of religious resort, near *Punjab*.

(4) This and a few other passages appear inconsistent with the principles of a *Soogot*; to reconcile it, therefore, it should be remarked, that, as he was issuing his orders to subjects of a different persuasion, it was natural for him to use a language the best calculated to strike them with awe, and bind them to a performance of his commands. The *Pundit*, by whose assistance this translation was made, when he was desired to explain this seeming contradiction, asked whether we did not, in our courts, swear a *Mussulman* upon the *Koran*, and a *Hindoo* by the waters of the *Ganges*, although we ourselves had not the least faith in either.

(5) *Lockee*—the *Hindoo* Goddess of Fortune.

Page 125. (1) *Bodheesotwo*—was the son of *Soogot*.

(2) *Beendhyo*—name of the mountains on the continent near *Ceylon*.

(3) *Komboge*—now called *Cambay*.

(4) *Kreeto Joog*—the first age of the world, sometimes called the *Suttee Joog*, or age of purity.

(5) *Bolee*—a famous giant of the first age, who is fabled to have conquered earth, heaven, and hell.

(6) *Bhargob*—a *Brahman*, who, having put to death all the princes of the earth, usurped the government of the whole.

(7) *Treetoo Joog*—the second age, or of three parts good.

(8) *Korno*



(8) *Korno*—a famous hero in the third age of the world. He was General to *Doorjodhon*, whose wars with *Joodisteer* are the subjects of the *Mohabharat*, the grand epick poem of the Hindoos.

(9) *Dwapor Joog*—the third age of the world.

(10) *Kolee Joog*—the fourth or present age of the world, of which 4882 years are elapsed.

(11) *Sokodweefsee*—an epithet of *Beekromaadeetyo*, a famous Raajaa. He succeeded his brother *Sokaadeetyo*, whom he put to death.

(12) *Dosaafyo*—one of the names of *Raabon*, whose wars with *Raam* are the subject of a poem called the *Raamayon*.

(13) *Luckeecoool*—now called *Luckeepoor*.

(14) *Boroon*—God of the ocean.

According to this account the Raajaa's dominions extended from the Cow's Mouth to Adam's Bridge in Ceylon, said to have been built by *Raam* in his wars with *Raabon*; from *Luckeepoor* as far as *Goozerat*.

(15) *Mood-go-gheeree*—now called *Mongueer*.

Page 126. (1) *Jumbosawweep*—according to the Hindoo geography, implies the habitable part of the earth.

(2) *Sree Nogor*—the ancient name of *Patna*.

(3) *Omaatyo*, prime minister. *Mohaa-kaarttaa-kreeteeko*, chief investigator of all things. *Mohaa-Dondo-Nayk*, chief officer of punishments. *Mohaa-Protee-haar*, chief keeper of the gates. *Mohaa-Saamonto*, generalissimo. *Mohaa-Dow-Saadhon-Saadhoneeko*, chief obviator of difficulties. *Mohaa-Koomaaraa-Matyo*, chief instructor of children. *Promaa-tree*, keeper of the records. *Sorobhongo*, patrols. *Raajostaaneeyo*, viceroy. *Ooporeeko*, superintendent. *Daafaaraadheeko*, investigator of crimes. *Chow-rod-dho-roneeko*, thief-catcher. *Daandeekeo*, mace-bearer. *Dondopaseeko*, keeper of the instruments of punishment. *Sowl-keeko*, collector of customs. *Gowlmeeko*, commander of a small party. *Kyotropo*, supervisor of cultivation. *Praantopaalo*, guard of the suburbs. *Kothtopaalo*, commander of a fort. *Kaandaarokyo*, guard of the wards of the city. *Todaa jooktoko*, chief guard of the wards. *Beeneejooktoko*, director of affairs. *Dootopryfoneeko*, chief of the spies. *Gomaa-Gomeeko*, messengers. *Obheevoromaano*, swift messengers. *Beefoypotee*, governor of a city. *Toropotee*, superintendent of the rivers. *Toreeko*, chief of the boats.

Page 127. (1) *Saafon*—signifies an edict.

(2) *Beads*—Hindoo Scriptures.

(3) *Jog*—Sacrifice.

(4) *Sombot*—implies the æra of Raajaa *Beekromadeetyo*. The Brahmins throughout Hindostan keep time according to the three following epochas: The *Kolyobdo*, from the flight of *Kreeschno*, or commencement of the *Kolee Joog*, 4882 years. The *Sombot*, from the death of *Beekromadeetyo*, 1837 years. The *Sokaabdo*, from the death of Raajaa *Soko*, 1703.

(5) *Slokes*—stanzas, commonly, but erroneously, written *Ashlogues*.

THE UNIVERSITY OF CHICAGO

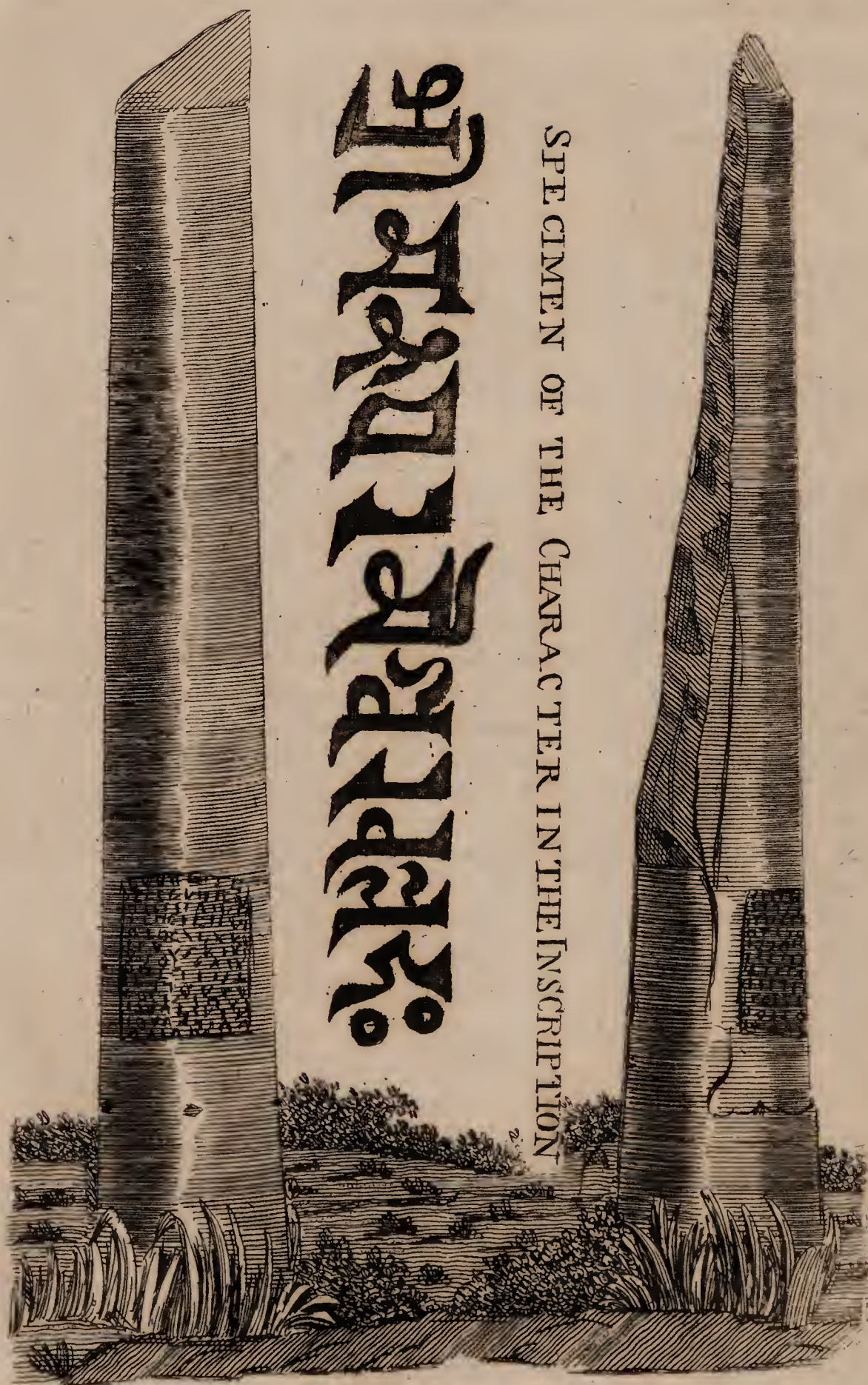
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श्रीशिवशैलेश्वरः

SPECIMEN OF THE CHARACTER IN THE INSCRIPTION



## INSCRIPTION

ON A PILLAR NEAR BUDDAL.

TRANSLATED FROM THE SANSKRIT.

BY CHARLES WILKINS, ESQUIRE.

SOME time in the month of November, in the year 1780, I discovered, in the vicinity of the town of *Buddal*, near which the Company have a factory, and which at that time was under my charge, a decapitated monumental column, which at a little distance has very much the appearance of the trunk of a cocoa-nut tree broken off in the middle. It stands in a swamp overgrown with weeds, near a small temple dedicated to *Hārgowrēē*, whose image it contains. Upon my getting close enough to the monument to examine it, I took its dimensions, and made a drawing of it; and soon after a plate was engraved, from which the accompanying is an impression.

It is formed of a single stone, of a dirty grey complexion; and it has lost by accident a considerable part of its original height. I was told upon the spot that it had, in the course of time, sunk considerably in the ground; but upon my digging about the foundation, I found this was not the case. At a few feet above the ground is an inscription, engraved in the stone, from which I took two reversed impressions with printer's ink. I have lately been so fortunate as to decypher the character; and I have the honour to lay before the Society a transcript of the original in the modern writing, and a translation; and at the same time to exhibit the two impressions I took from the stone itself.

The



The original character of this inscription is very different from the modern form; but it so much resembles that on the plate found by COL. WATSON at *Mongueer*, that I am induced to conclude it to be the work of the same period. The language is *Sāṃskrēēt*, and the whole is comprised in twenty-eight metrical verses of various measures.

CHARLES WILKINS.

14<sup>th</sup> July, 1785.

PROSPERITY!

PROSPERITY!

I.

*VĒĒRĀ DEV* was of the *Sāndēēlyā* race, (1;) from him was descended *Pānchāl*; of whose generation, and of whom, was *Gārgā* born.

II.

He, another *Sākṛā*, (2,) was ruler but of one quarter, and had no authority in other regions. He, too, was defeated by *Dityā* (3) chiefs; but, being a virtuous prince, he became supreme over every country without reserve; and his conduct was such, that he laughed *Vrēāhāspatēē* (4) to scorn.

III.

*Eechā* (5) was his wife; and like love, she was the mistress of his heart. She was admired for the native purity of her mind, and her beauty was like the light of the moon.

In

(1) A tribe of Brahmans still extant.

(2) Eendra, the God of the Heavens, who is supposed to be the Guardian of the East.

(3) Evil Spirits. *Eendra* is said to have lost his kingdom, for a while, to the Asōors, or evil spirits.

(4) The tutor of the good spirits, and the Planet Jupiter.

(5) Love, Desire.



## IV.

In his countenance, which was like the flower of the waters, (1,) were to be traced the lines of four sciences, (2.) The three worlds were held in subjection by his hereditary high rank.

From these two was descended a *Brāhmān* like *Kā-mālāyonēē*, (3,) and he took unto himself the name of *Srēē Dārbhā-pānēē* :

## V.

Whose country (extending to *Rēvā-Jānāk*, (4;) to the father of *Gowrēē*, (5,) whose piles of rocks reek with the juice exuding from the heads of intoxicated elephants, and whose snow-white mountains are brightened by the sun's rays; to the two oceans: to that whence *Arōōn* (6) riseth from its bed, and to that wherein the sun sinketh in the west) the Prince *Srēē Dēv Pāl*, (7,) by his policy, rendered tributary :

## VI.

At whose gates (although the prospect, hidden by the dust arising from the multitude of marching forces, was rendered clear from the earth, being watered by constant  
and

(1) The Lotus.

(2) Arms, Music, Mechanics, Physics.

(3) Brahma.

(4) Perhaps the *Narbadda*.

(5) The snowy Mountains that part India from Tartary. *Gowree*, one of the names of the *Parvatee*, the consort of *Seev*.

(6) The Charioteer of the Sun.—The Aurora of the Hindoos.

(7) If this be the Prince mentioned in the copper-plate found by Col. WATSON, he reigned at Mongueer above 1800 years ago.

and abundant streams, flowing from the heads of lustful elephants of various breeds) stood, scarce visible, amongst the vast concourse of nobles flocking to his standard from every quarter, *Srēē Dēv Pāl*, in expectation of his submission.

## VII.

Whose throne that Prince (who was the image of *Eēndrā*, and the dust of whose feet was impressed with the diadems of sundry potentates) himself ascended with a flash of glory, although he had formerly been wont to offer him large sums of *Pēētās*, (1,) bright as the lunar rays.

## VIII.

To him was born, of the Princess *Sārkārā*, the Brāhmān *Sōmēswār*, who was like *Sōm*, (2,) the offspring of *Atrēē*, and a favourite of the Most High.

## IX.

He adopted the manners of *Dhānānjay*, (3,) and did not exult over the ignorant and ill-favoured. He spent his riches amongst the needy. He neither vainly accepted adulation, nor uttered honey words. His attendants were attached by his bounty; and because of his vast talents, which the whole universe could not equal, he was the wonder of all good men.

Anxious

(1) A square coin.

(2) The Moon.

(3) One of the Sons of Pandoo, commonly called *Arjoon*.



## X.

Anxious for a home and an asylum, he took the hand of *Rānnā*, (1,) a Princess of his own likeness, according to the law, even as *Sēv* the hand of *Sēva*, (2,)—even as *Hārē* (3) the hand of *Lākṣmī*.

## XI.

From this pair proceeded into life, bursting forth like *Gōhā*, (4,) with a countenance of a golden hue, the fortunate *Kēdārā Mēśrā*, whose actions rendered him the favourite of heaven. The lofty diadem, which he had attained, shone with faultless splendor, kissing the vast circumference of the earth. His extensive power was hard to be limited; and he was renowned for boundless knowledge, raised from his own internal source.

## XII.

The ocean of the four sciences, which had been at a single draught drunk up, he brought forth again, and laughed at the power of *Agastyā*, (5.)

## XIII.

Trusting to his wisdom, the king of *Gowr* (6) for a long time enjoyed the country of the eradicated race of *Ootkal*, (7,) of the *Hoons*, (8,) of humbled pride, of the kings

(1) A Princess of this name is also mentioned in Colonel Watson's Plate.

(2) *Seeva* is the feminine of *Seev*.

(3) *Haree*, a name of *Veeshnoo*.

(4) *Gooha*, a name of *Karteek*.

(5) Who is said to have drunk up the Ocean.

(6) The kingdom of *Gowr* anciently included all the countries which now form the kingdom of Bengal on this side the *Brahmapootra*, except *Mongueer*.

(7) *Orixia*.

(8) *Huns*.

kings of *Drāvėēr* (1) and *Gōōjār*, (2,) whose glory was reduced, and the universal sea-girt throne.

## XIV.

He considered his own acquired wealth the property of the needy, and his mind made no distinction between the friend and the foe. He was both afraid and ashamed of those offences which condemn the soul to sink again into the ocean of mortal birth; and he despised the pleasures of this life, because he delighted in a supreme abode.

## XV.

To him, emblem of *Vrėėhăpătėė*, (3,) and to his religious rites, the Prince *Srėē Sōōră Pāl* (who was a second *Eendră*, and whose soldiers were fond of wounds) went repeatedly; and that long and happy companion of the world, which is girt with several oceans as with a belt, was wont, with a soul purified at the fountain of faith, and his head humbly bowed down, to bear pure water before him.

## XVI.

*Vănwā*, of celestial birth, was his consort, with whom neither the fickle *Lăkshmėē*, nor *Sătėē*, (4,) constant to her lord, were to be compared.

VOL. I.

M

XVII.

(1) A Country to the South of the Carnatick.

(2) Gozerat.

(3) The Preceptor of the good Spirits, and the Planet *Jupiter*.

(4) The Consort of *Seev*.



## XVII.

She, like another *Dēvākēē*, (1,) bore unto him a son of high renown, who resembled the adopted *Yāsōdhā*, (2,) and husband of *Lākshmēē*, (3.)

## XVIII.

This youth, by name *Srēē Gōṛāṅvā Mēśrā*, was acquainted with all the constellations. He resembled *Rām*, the son of *Jāmadāgnēē*, (4.) He was another *Rām*.

## XIX.

His abilities were so great, that he was solicitous to discover the essence of things, wherefore he was greatly respected by the Prince *Srēē Nārāyaṇ Pāl*. What other honour was necessary?

## XX.

His policy (who was of no mean capacity, and of a reputation not to be conceived) following the sense of the *Vēds*, was of boundless splendor; and, as it were a descent of *Dhārmā*, the Genius of Justice. It was regulated by the example of those who trust in the power of speech over things future, who stand upon the connexion of family, who are in the exercise of paying due

(1) The real mother of *Kreeshna*.

(2) The Foster-Mother of *Kreeshna*.

(3) *Rookmeene*, the Consort of *Kreeshna*. She is here called *Lakshmee*, in compliance with the idea of her being a descent of that Goddess.

(4) This is neither the Conqueror of *Ceylon*, nor the Brother of *Kreeshna*.

due praise to the virtues of great men, and who believe in the purity of *Astrology*.

## XXI.

In him was united a lovely pair, *Lākshmēē* and *Sārāswātēē*, the Disposer of Fortune, and the Goddess of Science, who seemed to have forsaken their natural enmity, and to stand together pointing at Friendship.

## XXII.

He laughed to scorn him who, in the assemblies of the learned, was intoxicated with the love of argument, and confounded him with profound and elegant discourses framed according to the doctrine of the *Sāstrās*; and he spared not the man who, because of his boundless power and riches, was overwhelmed with the pride of victory over his enemy in the field.

## XXIII.

He had a womb, but it obstinately bore him no fruit. One like him can have no great relish for the enjoyments of life. He never was blessed with that giver of delight, by obtaining which a man goeth unto another almoner, (1.)

## M 2

## XXIV.

(1) He had no Issue to perform the *Sradh* for the release of his Soul from the Bonds of Sin. By another Almoner is meant the Deity.



## XXIV.

He, who was, as it were, another *Vālmēṣkēṣ*, (1,) born in this dark age of impiety, amongst a dreadful and a cruel race of mortals, was a devout man, who displayed the learning of the *Vēds* in books of moral tales.

## XXV.

His profound and pleasing language, like *Gāṅgā*, flowing in a triple course (2) and constant stream, purifieth and delighteth.

## XXVI.

He, to whom, and to those of whose generation, men were wont to resort as it were to *Brāhmā*, waited so long in expectation of being a father, that, at length, he himself arrived at the state of a child.

## XXVII.

By him was recorded here upon this lasting column, the superior beauty of whose shaft catcheth the eye of the beholder, whose aspiring height is as boundless as his own ideas, which is, as it were, a stake planted in the breast of *Kālēṣ*, (3,) and on whose top sits *Tārکشyā*, (4,) the foe of serpents, and favourite bird of *Haree*, the line of his own descent.

## XXVIII.

(1) The first Poet of the Hindoos, and supposed Author of the *Ramayān*.

(2) He is supposed to have written in three languages.

(3) Time.

(4) Otherwise called *Garoor*.

## XXVIII.

*Gārōor*, like his fame, having wandered to the extremity of the world, and descended even unto its foundation, was exalted here with a serpent in his mouth.

This work was executed by the artist *Běëndōō Bhā-drā*.



## *Remarks on the two preceding Papers.*

By the PRESIDENT.

NO man has greater respect than myself for the talents of Mr. WILKINS, who, by decyphering and explaining the old *Sanscrit* Inscriptions lately found in these provinces, has performed more than any other *European* had learning enough to accomplish, or than any *Asiatick* had industry enough even to undertake: but some doubts having arisen in my mind concerning a few passages in the two preceding Translations, I venture to propose them in the form of Notes with entire deference to his judgment.

P. 123. l. 11. *This fortunate Prince*—Is not the first couplet in honour of BUDDHA, one of whose names, in the *Amarcosh*, is SUGATA? A follower of his tenets would have been denominated a *Saugat*, in the derivative form. We must observe, that the *Bauddhs*, or *Saugats*, are called *Atheists* by the *Brahmins*, whom they opposed; but it is mere invective; and this very grant fully disproves the calumny, by admitting a future state of rewards and punishments. SUGAT was a reformer; and every reformer must expect to be calumniated.

P. 123. l. 18. *When his innumerable army*—The third stanza in the original is here omitted, either by an oversight, or because the same image of *weeping elephants* occurs afterwards, and might have been thought superfluous in this place; nevertheless, I insert a literal translation of it.

“By whom, having conquered the earth as far as the ocean, it was left, as being unprofitably seized; so he declared: and his elephants weeping saw again in the forests their kindred, whose eyes were full of tears.”

P. 124. l. 18. *Of many countries*—The *Pandits* insist that *Rash-tracuta*, in the original, is the name of a particular country.

P. 127. l. 18. *Dated in the 33d Sombat*—That is, year; for *Samvat* is only an abbreviation of *Samvatsara*. This date, therefore, might only mean the thirty-third year of the King's reign; but, since VICRAMADITYA was surnamed the foe of SACA, and is praised by that name in a preceding stanza, we may safely infer, that the grant was dated thirty-three years after the date of that illustrious Emperor, whom the king of Gaur, though a Sovereign Prince, acknowledged as lord paramount of India.

P. 133. Verse II. *A virtuous Prince*—Many stanzas in this inscription prove, that the *Sandilya* family were not *Princes*; but that some of them were Prime Ministers to the Kings of Gaur, or Bengal, according to this comparative genealogy:

Kings.

Kings.	Ministers.*
GOPALA.	PANCHALA.
DHERMAPALA.	GARGA.
DEVAPALA. B. C. 23.	* DERBHAPANI.
RAJYAPALA.	SOMESWARA.
SURAPALA.	* CEDARAMISRA.
NARAYANAPALA. A. C. 67.	* GURAVAMISRA.

So that reckoning thirty years to a generation, we may date the Pillar of GURAVAMISRA in the sixty-seventh year *after* CHRIST. A *Pandit*, named RADHACANTA, with whom I read the original, appeared struck with my remark on the two families, and adopted it without hesitation; but if it be just, the second stanza must be differently interpreted. I suspect *Dharma*, the Genius of *Justice* or *Virtue*, to be the true reading, instead of *Dharmya*, or *virtuous*; and have no doubt that *puro* must be substituted for *paro*: the sense will then be, that INDRA *was ruler in the East only*; and, *though valiant, had been defeated even there by the Daityas or Titans*; but that DHARMA *was made Sovereign over him in all quarters*.

P. 134, Verse V. *Whose country*—The original is :

à révájanacánmatangajamadaśtimyachch'hilāsanghatéh,  
à gaurípituriswaréndraciranaihpūshyatsitimnógiréh,  
mārtan"dāśtamayódayārun'ajalād á vár'irāsīdwayāt,  
nītyā yasya bhuwan chacāra caradān sri dévapālō nrīpah.

The father of *Reva* is the *Mahendra* mountain in the south, in which that river has its source; as the father of GAURI is the *Himalaya* in the north, where ISWARA, who has a *moon* on his forehead, is believed often to reside: hence RADHACANTA proposed a conjectural emendation, which would have done honour to SCALIGER or BENTLEY. Instead of *Indra*, which is a name of the *Sun*, he reads *Indu*, or the *Moon*, by changing only a small straight line into a small curve; and then the stanza will run thus :

By whose policy the great Prince DEVLPALA made the earth tributary, from the father of *Reva*, whose piles-of-rocks-are-moist-with-juice-from-the-heads-of-lascivious-elephants, to the father-of-GAURI, whose white-mountains-are-brightened-with-beams-from-the-moon-of-ISWARA; and as far as the two-oceans-whose-waters-are-red-with-the-rising-and-with-the-setting-Sun.

The words connected by hyphens are compounds in *Sanscrit*.

P. 135. Verse VI. *Submission*—I understand *avasara* in this place, to mean the *leisure* of the Minister from public affairs, for which even the King waited at the head of his army.



P. 135. Verse VII. *Sums of Peetas*—The common sense of *pit'ha* is a *chair, seat, or throne*; and in this sense it occurs in the thirteenth verse. *Udupachch'habipit'ham*, or *with-a-seat-bright-as-the moon*, appears to be the compound epithet of *asanam*, or *chair of state*, which, though the King had often given to his Ministers, yet, abashed by his wisdom, and apprehensive of his popularity, he had himself ascended his throne *with fear*.

P. 136. Verse X. The tenth stanza is extremely difficult, as it contains many words with two meanings, applied in one sense to the Minister CEDARA MISRA; but, in another, to CARTICEYA, the *Indian Mars*: thus, in the first hemistich, *s' ic'hin* means *fire*, or a *peacock*; *s' ic'ha*, a *bright flame*, or a *crest*; and *s' acti*, either *power* or a *spear*. As the verse is differently understood, it may be a description of the *Brahmen*, or of the *Deity*.

P. 136. Verse XII. The *Brakmans* of this province insist, that by the four *Vidya's*, or branches of *knowledge*, are meant the four *Vedas*, not the *Upaveda's*, or *Medicine, Archery, Musick, and Mechanics*; and they cite two distichs from the *Agnipurana*, in which eighteen *Vidya's* are enumerated, and among them the *four Vedas*; three only of which are mentioned in the *Amarcosh*, and in several older books. In this verse also RADHACANT has displayed his critical sagacity: instead of *nala* he reads *bala*; and, if his conjecture be right, we must add, "*even when he was a boy.*"

P. 137. Verse XVI. *Constant to her lord*—RADHACANT reads *anapatyaya*, or *childless*, for *anupatyaya*; SATI having borne no children till she became regenerate in the person of PARVATI.

P. 139. Verse XXIII. *It obstinately bore him no fruit*.—The original stanza is uncommonly obscure: it begins with the words *yo-nirbabhuva*, the two first syllables of which certainly mean a *womb*: but several *Pandits*, who were consulted apart, are of opinion, that *yo* is the relative, of which some word in the masculine gender, signifying *speech*, is the antecedent, though not expressed: they explain the whole stanza thus—" *That speech, which came forth (nirbabhuva) inconsiderately, of which there was no fruit, he was a man who spoke nothing of that kind for his own gratification: he was a man also, by whom no present-of-playthings was ever given, which the suppliant having received, goes to another more bountiful giver.*" If the relative had been *yan* in the neuter gender, I should have acquiesced in the translation offered by the *Pandits*; but the suppression of so material a word as *speech*, which, indeed, is commonly *feminine* in *Sanscrit*, appears unwarrantably harsh according to *European* ideas of construction.

P. 140. Verse XXVI. If the preceding interpretation be just, the object of the Pillar was to perpetuate the names of GURAVA MISRA and his ancestors; and this verse must imply, that *he expected to receive from his own sons, the pious offices which he had performed to his forefathers.*

## V.

## SOME ACCOUNT

## OF THE

## SCULPTURES AND RUINS

## AT MAVALIPURAM,

*A Place a few Miles North of Sadras, and known to Seamen by the Name of the Seven Pagodas.*

BY WILLIAM CHAMBERS, Esq.

AS amidst inquiries after the histories and antiquities of *Asia* at large, those of that division of it in which this Society resides, may seem on many accounts to lay claim to a particular share of its attention, a few hints put down from recollection, concerning some monuments of *Hindoo* antiquity, which, though situated in the neighbourhood of *European* settlements on the *Choromandel* coast, have hitherto been little observed, may, it is conceived, be acceptable, at least as they may possibly give rise hereafter to more accurate observations, and more complete discoveries on the same subject. The writer of this account went first to view them in the year 1772, and curiosity led him thither again in 1776; but as he neither measured the distances nor size of the objects, nor committed to writing at the time, the observations he made on them, he hopes to be excused if, after the lapse of so many years, his recollection should fail him in some respects, and his account fall far short of that precision and exactness, which might have been expected, had there then existed in *India*, so powerful an incentive to diligent enquiry, and accurate communication, as the establishment of this Society must now prove.

The



The monuments he means to describe, appear to be the remains of some great city, that has been ruined many centuries ago ; they are situated close to the sea, between *Covelong* and *Sadras*, somewhat remote from the high road that leads to the different *European* settlements. And when he visited them in 1776, there was still a native village adjoining to them, which retained the ancient name, and in which a number of *Bramins* resided, that seemed perfectly well acquainted with the subjects of most of the Sculptures to be seen there.

The rock, or rather hill of stone, on which great part of these works are executed, is one of the principal marks for mariners as they approach the coast, and to them the place is known by the name of the *Seven Pagodas*, possibly because the summits of the rock have presented them with that idea as they passed : but it must be confessed, that no aspect which the hill assumes, as viewed on the shore, seems at all to authorize this notion ; and there are circumstances, which will be mentioned in the sequel, that would lead one to suspect, that this name has arisen from some such number of *Pagodas* that formerly stood here, and in time have been buried in the waves. But, be that as it may, the appellation by which the natives distinguish it, is of a quite different origin : in their language, which is the *Tamulic*, (improperly termed *Malabar*,) the place is called *Mâvalipuram*, which, in *Shanscrit*, and the languages of the more northern *Hindoos*, would be *Mahâ-balipûr*, or the *City of the great Bali*. For the *Tamulians*, (or *Malabars*,) having no *h* in their alphabet, are under a necessity of shortening the *Shanscrit* word *Mahâ*, great, and write it *mâ*.\* They are obliged also, for a similar reason, to substitute a *v* for a *b*, in words of *Shanscrit*, or other foreign original, that begin with that letter ; and the syllable *am*, at the end, is merely a termination,

\* They do indeed admit a substitute, but the abbreviation is most used.

mination, which, like *um* in *Latin*, is generally annexed to neuter substantives\*. To this etymology of the name of this place it may be proper to add, that *Bālī* is the name of an hero very famous in *Hindoo* romance; and that the river *Mávaligonga*, which waters the eastern side of *Ceylone*, where the *Tamulic* language also prevails, has probably taken its name from him, as, according to that orthography, it apparently signifies the *Ganges* of the great *Bālī*.

The rock, or hill of stone, above mentioned, is that which first engrosses the attention on approaching the place; for, as it arises abruptly out of a level plain of great extent, consists chiefly of one single stone, and is situated very near to the sea beach, it is such a kind of object as an inquisitive traveller would naturally turn aside to examine. Its shape is also singular and romantic, and, from a distant view, has an appearance like some antique and lofty edifice. On coming near to the foot of the rock from the north, works of imagery† and sculpture crowd so thick upon the eye, as might seem to favour the idea of a petrified town, like those that have been fabled in different parts of the world by too credulous travellers‡. Proceeding on by the foot of the hill, on the side facing the sea, there is a pagoda rising out of the ground of one solid stone, about sixteen or eighteen feet high, which seems to have been cut upon the spot out of a detached rock, that has been found

\* This explains also, why the *Shanscrit* word *Vêd*, by which the *Hindoos* denominate the Books of the Law of their Religion, is written by the *Tamulians*, *Vêdam*, which is according to the true orthography of their language, and no mistake of *European* travellers, as some have supposed; while the same word is called *Bêd* by the *Bengalies*, who have, in effect, no *V* in their alphabet.— See Dow; Vol. I. Dissert. p. 41.

† Among these one object, though a mean one, attracts the attention, on account of the grotesque and ridiculous nature of the design; it consists of two monkies cut out of one stone, one of them in a stooping posture, while the other is taking the insects out of his head.

‡ See SHAW'S Travels, p. 155, et seq.



found of a proper size for that purpose. The top is arched, and the style of architecture according to which it is formed, different from any now used in those parts. A little further on there appears upon a huge surface of stone, that juts out a little from the side of the hill, a numerous group of human figures in bas-relief, considerably larger than life, representing the most remarkable persons whose actions are celebrated in the *Mahâbharit*, each of them in an attitude, or with weapons, or other insignia, expressive of his character, or of some one of his most famous exploits. All these figures are, doubtless, much less distinct than they were at first; for, upon comparing these and the rest of the sculptures that are exposed to the sea air, with others at the same place, whose situation has afforded them protection from that element, the difference is striking; the former being every where much defaced, while the others are fresh as recently finished. This defacement is no where more observable than in the piece of sculpture which occurs next in the order of description. This is an excavation in another part of the east side of the great rock, which appears to have been made on the same plan, and for the same purpose, that Chowtries are usually built in that country, that is to say, for the accommodation of travellers. The rock is hollowed out to the size of a spacious room, and two or three rows of pillars are left, as a seeming support to the mountainous mass of stone which forms the roof. Of what pattern these pillars have originally been, it is not easy now to conjecture; for the air of the sea has greatly corroded them, as well as all the other parts of the cave. And this circumstance renders it difficult to discover, at first sight, that there is a scene of sculpture on the side fronting the entrance. The natives, however, point it out; and the subject of it is manifestly that of *Krishen* attending the herds of *Nund Ghose*, the *Admetus* of the *Hindoos*; from which circumstance *Krishen* is also called *Goupaul*, or the cowherd, as *Apollo* was entitled *Nomius*.

The objects that seem next to claim regard, are those upon the hill itself, the ascent of which, on the north, is, from its natural shape, gradual and easy at first, and is in other parts rendered more so by very excellent steps cut out in several places, where the communication would be difficult or impracticable without them. A winding stair of this sort leads to a kind of temple cut out of the solid rock, with some figures of idols in high relief upon its walls, very well finished, and perfectly fresh, as it faces the west, and is therefore sheltered from the sea air. From this temple again there are flights of steps, that seem to have led to some edifice, formerly standing upon the hill; nor does it seem absurd to suppose, that this may have been a palace, to which this temple, as a place of worship, may have appertained. For, besides the small detached ranges of stairs that are here and there cut in the rock, and seem as if they had once led to different parts of one great building, there appear in many places, small water channels cut also in the rock, as if for drains to a house; and the whole top of the hill is strewed with small round pieces of brick, which may be supposed, from their appearance, to have been worn down to their present form during the lapse of many ages. On ascending the hill by its slope on the north, a very singular piece of sculpture presents itself to view. On a plain surface of the rock, which may once have served as the floor of some apartment, there is a platform of stone, about eight or nine feet long, by three or four wide, in a situation rather elevated, with two or three steps leading up to it, perfectly resembling a couch or bed, and a lion very well executed at the upper end of it by way of pillow, the whole of one piece, being part of the hill itself. This the *Brahmins*, inhabitants of the place, called *the bed of Dhermarâjah* or *Judishter*, the eldest of the five brothers whose fortunes and exploits are the leading subject in the *Mahabhârit*. And at a considerable distance from this, at such a distance, indeed, as the apartment of the women might be supposed



posed to be from that of the men, is a bath excavated also from the solid rock, with steps in the inside, which the *Bramins* call the bath of *Dropedy*, the wife of *Judishter*, and his brothers. How much credit is due to this tradition, and whether this stone couch may not have been anciently used as a kind of throne rather than a bed, is matter for future inquiry. A circumstance, however, which may seem to favour this idea is, that a throne in the *Shanscrit*, and other *Hindoo* languages, is called *Singhâsen*, which is composed of the words *Sing*, a lion; and *âsen*, a seat.

These are all that appear on that part of the upper surface of the hill, the ascent to which is on the north; but, on descending from thence, you are led round the hill to the opposite side, in which there are steps cut from the bottom to a place near the summit, where is an excavation that seems to have been intended for a place of worship, and contains various sculptures of *Hindoo* deities. The most remarkable of these is a gigantic figure of *Vishnoo*, asleep on a kind of bed, with a huge snake wound about in many coils by way of pillow for his head; and these figures, according to the manner of this place, are all of one piece, hewn from the body of the rock.

But though these works may be deemed stupendous, they are surpassed by others that are to be seen at the distance of about a mile, or a mile and a half, to the southward of the hill. They consist of two Pagodas, of about thirty feet long by twenty feet wide, and about as many in height, cut out of the solid rock, and each consisting originally of one single stone. Near these also stand an elephant full as big as life, and a lion much larger

larger than the natural size, but very well executed, each hewn also out of one stone. None of the pieces that have fallen off in cutting these extraordinary sculptures, are now to be found near or any where in the neighbourhood of them, so that there is no means of ascertaining the degree of labour and time that has been spent upon them, nor the size of the rock or rocks from which they have been hewn, a circumstance which renders their appearance the more striking and singular. And though their situation is very near the sea-beach, they have not suffered at all by the corrosive air of that element, which has provided them with a defence against itself, by throwing up before them a high bank, that completely shelters them. There is also great symmetry in their form; though that of the Pagodas is different from the style of architecture according to which idol temples are now built in that country. The latter resemble the *Egyptian*; for the towers are always pyramidical, and the gates and roofs flat, and without arches; but these sculptures approach nearer to the *Gothic* taste, being surmounted by arched roofs or domes, that are not semicircular, but composed of two segments of circles meeting in a point at top. It is also observable, that the lion in this group of sculptures, as well as that upon the stone couch above mentioned, are perfectly just representations of the true lion; and the natives there give them the name which is always understood to mean a lion in the *Hindoo* language, to wit, *Sing*: but the figure which they have made to represent that animal in their idol temples for centuries past, though it bears the same appellation, is a distorted monster, totally unlike the original; inasmuch, that it has from hence been supposed that the lion was not anciently known in this country, and that *Sing* was a name given to a monster that existed only in *Hindoo* romance. But it is plain that that animal was well known to the authors of these works, who, in manners as well as arts, seem to have differed much from the modern *Hindoos*.

There



There are two circumstances attending these monuments, which cannot but excite great curiosity, and on which future inquiries may possibly throw some light. One is, that on one of the Pagodas last mentioned, there is an inscription of a single line, in a character at present unknown to the *Hindoos*. It resembles neither the *Deyva-nâgre*, nor any of the various characters connected with or derived from it, which have come to the writer's knowledge from any part of *Hindostan*. Nor did it, at the time he viewed it, appear to correspond with any character, *Asiatick* or *European*, that is commonly known. He had not then, however, seen the alphabet of the *Balic*, the learned language of the *Siamefe*, a sight of which has since raised in his mind a suspicion that there is a near affinity between them, if the character be not identically the same. But as these conjectures, after such a lapse of time, are somewhat vague, and the subject of them is perhaps yet within the reach of our researches, it is to be hoped that some method may be fallen upon of procuring an exact copy of this inscription.

The other circumstance is, that though the outward form of the Pagodas is complete, the ultimate design of them has manifestly not been accomplished, but seems to have been defeated by some extraordinary convulsion of nature. For the western side of the most northerly one is excavated to the depth of four or five feet, and a row of pillars left on the outside to support the roof: but here the work has been stopped, and an uniform rent of about four inches breadth has been made throughout the solid rock, and appears to extend to its foundations, which are probably at a prodigious depth below the surface of the ground. That this rent has happened since the work was begun, or while it was carrying on, cannot be doubted; for the marks of the mason's tools are perfectly visible in the excavated part on both sides of the rent, in such a manner as to show plainly that

that they have been divided by it. Nor is it reasonable to suppose that such a work would ever have been designed, or begun, upon a rock that had previously been rent in two.

Nothing less than an earthquake, and that a violent one, could apparently have produced such a fissure in the solid rock; and that this has been the case in point of fact, may be gathered from other circumstances, which it is necessary to mention in an account of this curious place.

The great rock above described, is at some small distance from the sea, perhaps fifty or an hundred yards, and in that space the *Hindoo* village before mentioned stood in 1776. But close to the sea are the remains of a Pagoda, built of brick, and dedicated to *Sib*, the greatest part of which has evidently been swallowed up by that element: for the door of the innermost apartment, in which the idol is placed, and before which there are always two or three spacious courts surrounded with walls, is now washed by the waves; and the pillar used to discover the meridian at the time of founding the Pagoda\*, is seen standing at some distance in the sea. In the neighbourhood of this building there are some detached rocks, washed also by the waves, on which there appear sculptures, though now much worn and defaced. And the natives of the place declared to the writer of this account, that the more aged people among them remembered to have seen the tops of several pagodas far out in the sea, which being covered with copper, (probably gilt,) were particularly visible at sun-rise, as their shining surface used then to reflect the sun's rays; but that now that effect was no longer produced, as the copper had since become incrustated with mould and verdigrease.

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\* See Voyage du M. Gentil, Vol. I. page 152.



These circumstances look much like the effects of a sudden inundation ; and the rent in the rock above described, makes it reasonable to conjecture, that an earthquake may have caused the sea to overflow its boundaries, and that these two formidable enemies may have joined to destroy this once magnificent city. The account which the *Bramins*, natives of the place, gave of its origin and downfal, partly, it should seem, on the authority of the *Mahabhârit*, and partly on that of later records, at the same time that it countenances this idea, contains some other curious particulars, which may seem to render it worthy of attention. Nor ought it to be rejected on account of that fabulous garb, in which all nations, but especially those of the east, have always clad the events of early ages.

“ *Hirinâcheren* (said they) was a gigantick Prince,  
 “ that rolled up the earth into a shapeless mass, and  
 “ carried it down to the abyfs, whither *Vishnoo* fol-  
 “ lowed him in the shape of an hog, killed him with  
 “ his tusks, and replaced the earth in its original situa-  
 “ tion. The younger brother of *Hirinâcheren* was  
 “ *Hirinakassap*, who succeeded him in his kingdom,  
 “ and refused to do homage to *Vishnoo*. He had a son,  
 “ named *Pralhaud*, who, at an early age, openly disap-  
 “ proved this part of his father’s conduct, being under  
 “ the tuition of *Sokerâchârj*. His father persecuted  
 “ him on this account, banished him, and even sought  
 “ to kill him, but was prevented by the interposition  
 “ of heaven, which appeared on the side of *Pralhaud*.  
 “ At length *Hirinakassap* was softened, and recalled  
 “ his son to his court, where, as he sat in full assem-  
 “ bly, he began again to argue with him against the  
 “ supremacy of *Vishnoo*, boasted that he himself was  
 “ lord of all the visible world, and asked what *Vish-*  
 “ *noo* could pretend to more. *Pralhaud* replied, that  
 “ *Vishnoo* had no fixed abode, but was present every  
 “ where. ‘ Is he (said his father) in that pillar ?’ ‘ Yes,’  
 “ returned *Pralhaud*. “ Then let him come forth,”  
 “ said

“ said *Hirinakassap* ; and, rising from his seat, struck  
 “ the pillar with his foot ; upon which *Viṣṇoo*, in the  
 “ *Narasinghah Awtâr*, that is to say, with a body like  
 “ a man, but an head like a lion, came out of the pil-  
 “ lar, and tore *Hirinakassap* in pieces. *Viṣṇoo* then  
 “ fixed *Pralhaud* on his father’s throne ; and his reign  
 “ was a mild and virtuous one, and as such was a con-  
 “ trast to that of his father. He left a son, named *Na-*  
 “ *machee*, who inherited his power and his virtues, and  
 “ was the father of *Balee*, the founder of the once mag-  
 “ nificent city of *Mahâbalipoor*, the situation of which  
 “ is said to be described in the following verse, taken  
 “ from the *Mahabhârit*.”

গঙ্গায়াঃ দক্ষিণেভাগে যোজনানা° শতদ্বয়°—

পঞ্চযোজন যাত্রা পূর্ব্বাৱিষিদ্ভু পশ্চিমে—

The sense of which is literally this :

“ South of the *Ganges* two hundred *Yojen*,  
 “ Five *Yojen*\* westward from the Eastern Sea.”

Such is the *Bramin* account of the *origin* of this place. The *sequel* of its history, according to them, is as follows :

N 2

“ The

\* The *Yojen* is a measure often mentioned in the *Sanskrit* books, and, according to some accounts, is equal to nine, according to others, twelve, *English* miles. But at that rate the distance here mentioned, between this place and the *Ganges*, is prodigiously exaggerated, and will carry us far south of *Ceylone*. This, however, is not surprising in an *Hindoo* poem ; but, from the second line, it seems pretty clear, that this city, at the time this verse was composed, must have stood at a great distance from the sea.



“ The son of *Balee* was *Banâcheren*, who is repre-  
 “ sented as a giant with a thousand hands. *Anuredh*,  
 “ the son of *Krishen*, came to his court in disguise, and  
 “ seduced his daughter, which produced a war, in the  
 “ course of which *Anuredh* was taken prisoner, and  
 “ brought to *Mahabâlipoor*; upon which *Krishen* came  
 “ in person from his capital, *Duârikah*, and laid siege  
 “ to the place. *Sib* guarded the gates, and fought for  
 “ *Banâcheren*, who worshipped him with his thousand  
 “ hands: but *Krishen* found means to overthrow *Sib*,  
 “ and having taken the city, cut off all *Banâcheren*’s  
 “ hands, except two, with which he obliged him to do  
 “ him homage. He continued in subjection to *Krishen*  
 “ till his death; after which a long period ensued, in  
 “ which no mention is any where made of this place,  
 “ till a prince arose, whose name was *Malêcheren*, who  
 “ restored the kingdom to great splendor, and en-  
 “ larged and beautified the capital.” But in his time  
 the calamity is said to have happened by which the  
 city was entirely destroyed; and the cause and man-  
 ner of it have been wrapt up by the *Bramins* in  
 the following fabulous narration. “ *Malêcheren*, (say  
 they,) in an excursion which he made one day alone,  
 “ and in disguise, came to a garden in the environs  
 “ of the city, where was a fountain so inviting, that  
 “ two celestial nymphs had come down to bathe  
 “ there. The *Rajah* became enamoured of one of  
 “ them, who condescended to allow of his attachment  
 “ to her; and she and her sister nymph used thence-  
 “ forward to have frequent interviews with him in  
 “ that garden. On one of those occasions, they  
 “ brought with them a male inhabitant of the hea-  
 “ venly regions, to whom they introduced the *Rajah*;  
 “ and between him and *Malêcheren* a strict friendship  
 “ ensued; in consequence of which, he agreed, at the  
 “ *Rajah*’s earnest request, to carry him in disguise to  
 “ see the court of the divine *Inder*, a favour never be-  
 “ fore granted to any mortal. The *Rajah* returned  
 “ from thence with new ideas of splendor and mag-  
 “ nificence,



“ nificence, which he immediately adopted in regu-  
 “ lating his court, and his retinue, and in beautifying  
 “ his seat of government. By this means *Mahâbalipoor*  
 “ became soon celebrated beyond all the cities of the  
 “ earth; and an account of its magnificence having  
 “ been brought to the gods assembled at the court of  
 “ *Inder*, their jealousy was so much excited at it, that  
 “ they sent orders to the God of the Sea to let loose  
 “ his billows, and overflow a place which impiously  
 “ pretended to vie in splendor with their celestial man-  
 “ sions. This command he obeyed; and the city was  
 “ at once overflowed by that furious element, nor has  
 “ it ever since been able to rear its head.”

Such is the mode in which the *Bramins* choose to account for the signal overthrow of a place devoted to their wretched superstitions.

It is not, however, improbable, that the rest of this history may contain, like the mythology of *Greece* and *Rome*, a great deal of real matter of fact, though enveloped in dark and figurative representations. Through the disguise of these we may discern some imperfect records of great events, and of revolutions that have happened in remote times; and they perhaps merit our attention the more, as it is not likely that any records of ancient *Hindoo* history exist but in this obscure and fantastic dress. Their poets seem to have been their only historians, as well as divines; and whatever they relate, is wrapped up in this burlesque garb, set off, by way of ornament, with circumstances hugely incredible and absurd, and all this without any date, and in no other order or method, than such as the poet's fancy suggested, and found most convenient. Nevertheless, by comparing names and grand events, recorded by them, with those interspersed in the histories of other nations, and by calling in the assistance of ancient monuments, coins, and inscriptions, as occasion shall offer,



offer, some probable conjectures, at least, if not important discoveries, may, it is hoped, be made on these interesting subjects. It is much to be regretted, that a blind zeal, attended with a total want of curiosity, in the *Mahommedan* governors of this country, have been so hostile to the preservation of *Hindoo* monuments and coins. But a spirit of enquiry among *Europeans* may yet perhaps be successful; and an instance which relates to the place above described, though in itself a subject of regret, leaves room to hope that futurity may yet have in store some useful discoveries. The *Kauzy* of *Madras*, who had often occasion to go to a place in the neighbourhood of *Mahâbalipoor*, assured the writer of this account, that within his remembrance, a ryot of those parts had found, in plowing his ground, a pot of gold and silver coins, with characters on them which no one in those parts, *Hindoo* or *Mohammedan*, was able to decypher. He added, however, that all search for them would now be vain, for they had doubtless been long ago devoted to the crucible, as, in their original form, no one there thought them of any value.

The inscription on the Pagoda mentioned above, is an object which, in this point of view, appears to merit great attention. That the conjecture, however, which places it among the languages of *Siam*, may not seem in itself chimerical, the following passages from some authors of repute are here inserted, to shew, that the idea of a communication having formerly subsisted between that country and the Coast of *Choromandel* is by no means without foundation; nay, that there is some affinity, even at this day, between the *Balic* and some of the *Hindoo* languages, and that the same mode of worship seems formerly to have prevailed in the *Deckan* which is now used by the *Siamese*.

*Monsieur*

*Monsieur de la Loubere*, in his excellent account of *Siam*, speaks thus of the origin of the *Balic* language.

“ The Siamese (says he) do not mention any country where the Balic language, which is that of their laws and their religion, is at present in use. They suppose, indeed, on the report of some among them, who have been on the Coast of Choromandel, that it bears some resemblance to some of the dialects of that country; but they at the same time allow, that the character in which it is written, is not known but among themselves. The secular Missionaries settled at Siam, believe that this language is not entirely a dead one; because they have seen in their hospital a man from the neighbourhood of Cape Comorin, who mixed several Balic words in his discourse, declaring that they were in use in his country, and that he himself had never studied nor knew any other than his mother tongue. They at the same time mention, as matter of certainty, that the religion of the Siamese comes from those parts; as they have read in a Balic book, that Sommonacodom, the idol of the Siamese, was the son of a King of Ceylone.”\*

The

\* “ Les Siamois ne nomment aucun pais, ou la langue Bali qui est celle de leurs loix et de leur religion, soit aujourd'hui en usage. Ils soupçonnent a la verite, sur le rapport de quelques-uns d'entre eux, qui ont ete a la Côte de Coromandel, que la langue Balic a quelque ressemblance avec quelqu'un des dialects de ce pais la : mais ils conviennent en même temps que les lettres de la langue Balic ne sont connues que chez eux. Les Missionnaires séculiers a Siam croient que cette langue n'est pas entièrement morte; parce qu'ils ont vu dans leur hospital un homme des environs du Cap de Comorin, qui metoit plusieurs mots Balis dans son langage, assurant qu'ils estoient en usage en son pais, et que luy n'avoit jamais étudié, et ne savoit que sa langue maternelle. Ils donnent d'ailleurs pour certain que la religion des Siamois vient de ces quartiers la, parce qu'ils ont lu dans un livre Balic que Sommonacodom que les Siamois adorent, etoit fils d'un Roi de l'isle de Ceylone.”



The language of the man mentioned in this passage, who came from the neighbourhood of *Cape Comorin*, could be no other than the *Tamulic*; but the words here alluded to may very possibly have been derivatives from the *Shanscrit*, common to both that and the *Balic*.

In another part of the same work, where the author treats of the history of *Sommonacodom* at large, on the authority of the *Balic* books, he says,

“ The father of *Sommonacodom*, according to the  
“ same *Balic* book, was a King of *Teve Lanca*; that  
“ is to say, of the famous *Ceylone*.”\*

Here it is observable, that, while the country of *Siam* seems to be utterly unknown both to the natives of *Ceylone* and *Hindostan*, *Ceylone* should nevertheless be so well known to the *Siamefe*, and under the same appellation it bears in the *Shanscrit*. An epithet is also here prefixed to it, which seems to be the same as that used by the *Hindoos* in speaking of that island; for they also call it, in *Shanscrit*, *Dêve Lanca*, or the *Sacred Lanca*. From several passages in the same work, it also appears, that the *Shanscrit* word *Mâha*, which signifies *great*, is constantly used in the *Balic* language in the same sense. And the names of the days of the week are most of them the same in *Shanscrit* and in *Balic*, as may be seen in the following comparison of them.

*Shanscrit.*

Aditta-vâr,

*Balic.*

Van Athit.

Sunday.

Soma-vâr,

\* “ Le pere de *Sommonacodom* étoit, selon ce mesme livre *Bali*,  
“ un Roi de *Teve Lanca*, c'est-à-dire un Roi de la celebre *Ceylan*.”

<i>Shanscrit.</i>	<i>Balic.</i>	
Soma-vâr,	Van * Tchân,	Monday.
Mungela-vâr,	Van Angkaan,	Tuesday.
Bouta-vâr,	Van Pout,	Wednesday.
Brahspati-vâr,	Van Prahout,	Thursday.
Soucra vâr,	Van Souc,	Friday.
Sany-vâr,	Van Sâoa,	Saturday.

The same author gives, in another place, an account of a pretended print of a foot on a rock, which is an object of worship to the *Siamese*, and is called *Prabât*, or the venerable foot. For *prâ*, in *Balic*, he says, signifies *venerable*, which agrees with *prâper* and *pramesht* in *Shanscrit*; and *bât* in the same tongue is a foot, as *pâd* in *Shanscrit*. After which he goes on to say :

“ We know that in the island of Ceylone there is a pretended print of a human foot, which has long been held in great veneration. It represents, doubtless, the left foot; for the Siamese say that Sommonacodom set his right foot on their *Prabât*, and his left foot at *Lanca*†.”

From KNOX's History of *Ceylone* it appears, that the impression here spoken of, is upon the hill called, by the *Chingelays*, *Hamalell*; by *Europeans*, *Adam's Peak*; and that the natives believe it to be the foot-step of their great

\* Here one *Hindoo* word is substituted for another; for *Tchân* in *Hindostany*, and *Tchânder* in *Shanscrit*, signify the moon as well as *Somer*.

† “ On sait que dans l'isle de Ceylan, il y a un pretendu vestige de pié humain, que depuis long temps y est en grande vénération. Il represente, sans doute, le pié gauche; car les Siamois disent que Sommonacodom posa le pié droit à leur *prabat*, et le pié gauche à *Lancà*.”



great idol *Buddou* ; between the worship of whom, as described by KNOX, and that of *Sommonacodom*, as related by M. DE LA LOUBERE, there is a striking resemblance in many particulars, which it may be proper here to enumerate.

1<sup>st</sup>. Besides the footsteps above mentioned, there is a kind of tree (which, from description, appears to be the *Pipel* tree, so well known in *India*) which the *Chingelays* hold sacred to *Buddou*, and the *Siamefe* to *Sommonacodom* ; insomuch that the latter deem it meritorious to hang themselves upon it. The *Chingelays* called it *Bogahah* ; for *gahah*, in their language, signifies a tree ; and *bo* seems to be an abbreviation of *Bod*, or *Buddou* ; and the *Siamefe* call it, in *Balic*, *Pra si Mahà Pout*, which, according to DE LA LOUBERE'S interpretation, signifies the tree of the great *Pout*\*. This he supposes to mean *Mercury* ; for he observes that *Pout*, or *Poot*, is the name of that planet in the *Balic* term for *Wednesday* ; and in another place, he says, *Pout* is one of the names of *Sommonacodom*. It is certain that *Wednesday* is called the day of *Bod*, or *Budd*, in all the *Hindoo* languages, among which the *Tamulic*, having no *b*, begins the word with a *p*, which brings it very near the *Balic* mode of writing it. It is equally certain that the days of the week, in all these languages, are called after the planets in the same order as with us, and that *Bod*, *Budd*, or *Pood*, holds the place of *Mercury*. From all which it should appear that *Pout*, which, among the *Siamefe*, is another name for *Sommonacodom*, is itself a corruption of *Buddou*, who is the *Mercury* of the *Greeks*. And it is singular that, according to M. DE LA LOUBERE, the mother of *Sommonacodom*, is called, in *Balic*, *Mahà-mania*, or the great *Mania*, which resembles much the name of *Maia*, the mother

\* In vulgar *Siamese* they call it *Ton-pó*.

mother of *Mercury*. At the same time that the *Tamulic* termination *en*, which renders the word *Pooden*, creates a resemblance between this and the *Woden* of the *Gothic* nations, from which the same day of the week is denominated, and which, on that and other accounts, is allowed to be the *Mercury* of the *Greeks*.

2dly. The temples of *Sommonacodom* are called *Pihân*; and round them are habitations for the priests, resembling a college; so those of *Buddou* are called *Vihâr*, and the principal priests live in them as in a college. The word *Vihâr*, or, as the natives of *Bengal* would write it, *Bihâr*, is *Shanscrit*; and *Ferish-tah*, in his *History of Bengal*, says, that this name was given by the *Hindoos* to the Province of *Behâr*, because it was formerly so full of *Bramins*, as to be, as it were, one great *seminary of learning*, as the word imports.

3dly. The *Siamefe* have two orders of priests, and so have the worshippers of *Buddou*. Both the one and the other are distinguished by a yellow habit, and by another circumstance which must be mentioned in the words of the respective authors. KNOX says of the *Buddou* priests, "They have the honour of carrying the *Tallipot* with the broad end over their heads foremost, which none but the King does." And M. DE LA LOUBERE says of the *Siamefe* priests, "To defend themselves from the sun they have the *Talapat*, which is their little umbrella, in the form of a screen\*."

The

\* "Pour se garentir du soleil ils ont le Talapat, qui est leur petit parasol en forme d'écran."



The word here used is common to most of the *Hindoo* languages, and signifies *the leaf of the Palmyra tree*. M. DE LA LOUBERE mentions it as a *Siamese* word, without seeming to know its origin, or primary signification.

4thly. The priests of *Buddou*, as well as those of *Sommonacodom*, are bound to celibacy as long as they continue in the profession; but both the one and the other are allowed to lay it down and marry.

5thly. They both eat flesh, but will not kill the animal.

6thly. The priests of either nation are of no particular tribe, but are chosen out of the body of the people.

These circumstances plainly show that this is a system of religion different from that of the *Véds*; and some of them are totally inconsistent with the principles and practice of the *Bramins*. And, indeed, it is manifest, from KNOX's whole account, that the religion of the *Chingelays* is quite distinct from that which prevails at this day among the *Hindoos*; nor does it appear that there is such a race of men as that of the *Bramins* among them. The only part in which there seems to be any agreement, is in the worship of the *Debtahs*, which has probably crept in among them from their *Tamulian* neighbours; but that is carried on in a manner very different from the *Braminical* system, and appears to be held by the nation at large in very great contempt, if not abhorrence. KNOX's account of it is this: "Their temples (i. e. those of the *Debtahs*) are, he says, "called *Covels*," which is the *Tamulic* word for *Pagoda*. He then goes on to say, "A man piously disposed, builds a small house at his own charge, which

“ which is the *temple*, and *himself becomes priest thereof*.  
 “ This house is seldom called *God's House*, but most  
 “ usually *Jacco*, the *Devil's*.” But of the prevailing  
 religion, he speaks in very different terms, and describes  
 it as carried on with much parade and splendor, and  
 attended with marks of great antiquity. “ The Pagodas  
 “ or temples of their Gods (says he) are so many that I  
 “ cannot number them. Many of them are of rare and  
 “ exquisite work, built of hewn stone, engraven with  
 “ images and figures; but by whom, and when, I could  
 “ not attain to know, the inhabitants themselves being  
 “ ignorant therein. But sure I am, they were built by  
 “ far more ingenious artificers than the Chingelays that  
 “ now are on the land. For the Portuguese, in their  
 “ invasions, have defaced some of them, which there is  
 “ none found that hath skill enough to repair to this  
 “ day.” In another place he says, “ Here are some  
 “ ancient writings, engraven upon rocks, which puzzle  
 “ all that see them. There are divers great rocks in  
 “ divers parts in *Cande Uda*, and in the northern parts.  
 “ These rocks are cut deep with great letters for the  
 “ space of some yards, so deep that they may last to the  
 “ world's end. Nobody can read them, or make any  
 “ thing of them. I have asked Malabars and Gentoos,  
 “ as well as Chingelays and Moors, but none of them  
 “ understood them. There is an ancient temple, God-  
 “ diladenni in Yattanour, stands by a place where there  
 “ are of these letters.” From all which the antiquity  
 of the nation and their religion is sufficiently evident:  
 and from other passages it is plain, that the worship of  
*Buddou*, in particular, has been from remote times a  
 very eminent part of that religion: for the same author,  
 speaking of the tree at *Anurodgburro*, in the northern  
 part of the island, which is sacred to *Buddou*, says,  
 “ The due performance of this worship they reckon not  
 “ a little meritorious; insomuch that, as they report,  
 “ ninety kings have reigned there successively, where,  
 “ by the ruins that still remain, it appears, they spared  
 “ not for pains and labour to build temples and high  
 “ monuments



“ monuments to the honour of this God, as if they had  
 “ been born to hew rocks and great stones, and lay  
 “ them up in heaps. These Kings are now happy  
 “ spirits, having merited it by these labours.” And  
 again he says, “ For this God, above all other, they  
 “ seem to have a high respect and devotion,” &c.

And from other authorities it will appear, that this worship has formerly been by no means confined to *Ceylone*, but has prevailed in several parts of *India* prior to that of the *Bramins* : nay, that this has been the case even so late as the ninth and twelfth centuries of the *Christian* era.

In the well-known \* *Anciennes Relations*, translated from the *Arabic*, by that eminent orientalist EUSEBIUS RENAUDOT, the *Arabian* traveller gives this account of the custom of dancing-women, which continues to this day in the *Deckan*, but is not known among the *Hindoos* of *Bengal*, or *Hindostan* Proper.

“ There are in India public women, called *women*  
 “ of the idol, and the origin of this custom is this :  
 “ When a woman has made a vow for the purpose of  
 “ having children, if she brings into the world a pretty  
 “ daughter, she carries it to *Bod*, (so they call the idol  
 “ which they adore,) and leaves it with him†.”

This

\* *Anciennes Relations des Indes et de la Chine, de deux Voyageurs Mohametans, qui y allerent dans le neuvieme Siecle.—Paris, 1718, 8vo.*

† “ Il ya dans les Indes des femmes publiques, appellés, femmes  
 “ de l'idole, l'origine de cette coustume est telle ; Lors qu'une  
 “ femme a fait un voeu pour avoir des enfans, si elle met au monde  
 “ une belle fille, elle l'apporte au *Bod*, c'est ainsi qu'ils appellent  
 “ l'idole qu'ils adorent, aupres duquel elle la laisse, &c.” *Anc. Rel.* p. 109.

This is a pretty just account of this custom as it prevails at this day in the *Deckan*; for children are, indeed, devoted to this profession by their parents; and when they grow up in it, they are called, in *Tamulic*, *Devadâsi*, or *female slaves of the idol*. But it is evident they have changed their master since this *Arabian* account was written, for there is no idol of the name of *Bod* now worshipped there. And the circumstance of this custom being unknown in other parts of *India*, would lead one to suspect that the *Bramins*, on introducing their system of religion into that country, had thought fit to retain this part of the former worship, as being equally agreeable to themselves and their new disciples.

The same *Arabian* traveller gives us an account of a very powerful race of *Hindoo* Kings (according to them, indeed, the most powerful in *India*) who then reigned on the *Malabar* Coast with the title of *Balhâra*. Their dominion appears to have extended over *Guzerat*, and the greatest part, if not the whole, of the ancient kingdom of *Vishnâpoor*. For the *Arabian* geographer, quoted by M. *RENAUDOT*, makes *Nahelvârah* the metropolis of these Princes, which is, doubtless, *Nahelvalah*, the ancient capital of *Guzerat*; though M. *RENAUDOT* seems not to have known that place; and the rest of the description sufficiently shows the great extent of their dominion southward. M. *D'ANVILLE* speaks of this race of Kings on the authority of the *Arabian* geographer *EDRISI*, who wrote in the twelfth century, according to whom it appears, that their religion was, even so late as that period, not the *Braminical*, but that of which we are now speaking. M. *D'ANVILLE*'s words are these: "Edrisi acquaints us with the religion which this Prince professed, in saying, that his worship was addressed to *Bodda*, who, according to St. Jerome, and Clemens Alexandrinus, was the founder of the sect of the *Gymnosophists*, in like manner



“manner as the Bramins were used to attribute their  
“institution to Brahma\*.”

The authority of CLEMENS ALEXANDRINUS is also cited on the same subject by RELANDUS in his 11th Dissertation, where, treating of the language of *Ceylone*, he explains the word *Vehâr*, above spoken of, in these terms :

“Vehâr signifies a temple of their principal God  
“Buddou, who, as Clemens Alexandrinus has long  
“ago observed, was worshipped as a God by the  
“Hindoost†.”

After the above quotations, the following extract from the voyage of that inquisitive and ingenious traveller M. GENTIL, published in 1779, is given as a further and very remarkable illustration of this subject.

“This system is also that of the Bramins of our  
“time; it forms the basis of that religion which they  
“have brought with them into the southern parts of the  
“Peninsula of Hindostan, into Madura, Tanjore, and  
“Maïffore.

“There was then in those parts of India, and prin-  
“cipally on the Coast of Choromandel and Ceylone, a  
“fort

\* “L’Edrisi nous instruit sur la religion que professoit ce Prince,  
“en disant que son culte s’adressoit a Boddâ, que selon St. JE-  
“ROME & St. CLEMENT D’ALEXANDRIE, avoit ete l’instituteur des  
“Gymnosophistes comme les Brachmanes rapportotient a Brahma  
“leur institut.” Ant. Geog. de L’Inde, p. 94.

† “*Vehâr*, templum dei primarii Buddoe *Βούττα* quem Indos ut  
“Deum venerari jam olim notavit Clemens Alexandrinus.” Storm.  
lib. 1. p. 223. Rel. Diss. pars tertia, p. 85.

“ sort of worship, the precepts of which we are quite  
 “ unacquainted with. The God Baouth, of whom at  
 “ present they know no more in India than the name,  
 “ was the object of this worship; but it is now totally  
 “ abolished; except that there may possibly yet be found  
 “ some families of Indians who have remained faithful  
 “ to Baouth, and do acknowledge the religion of  
 “ the Bramins, and who are on that account separated  
 “ from, and despised by, the other casts.

“ I have not, indeed, heard that there are any such  
 “ families in the neighbourhood of Pondicherry; but  
 “ there is a circumstance, well worthy of remark,  
 “ which none of the travellers that have treated of the  
 “ Coast of Choromandel and Pondicherry seem to have  
 “ noticed. It is this, that at a short league’s distance  
 “ to the south of this town, in the plain of Virapatnam,  
 “ and pretty near the river, we find a statue of granite  
 “ very hard and beautiful. This statue, which is from  
 “ three feet to three and a half in height, is sunk in the  
 “ sand to the waist, and weighs doubtless many thousand  
 “ weight: it is, as it were, abandoned in the midst of  
 “ this extensive plain. I cannot give a better idea of  
 “ it, than by saying, that it exactly agrees with and re-  
 “ sembles the Sommonacodom of the Siamese; its head  
 “ is of the same form, it has the same features, its arms  
 “ are in the same attitude, and its ears are exactly similar.  
 “ The form of this divinity, which has certainly been  
 “ made in the country, and which in no respect resembles  
 “ the present idols of the Gentoos, struck me as I passed  
 “ this plain. I made various inquiries concerning this  
 “ singular figure, and the Tamulians, one and all, as-  
 “ sured me that this was the God Baouth, who was now  
 “ no longer regarded, for that his worship and his festi-  
 “ vals had been abolished ever since the Bramins had  
 “ made themselves masters of the people’s faith.”\*

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*M. Gentil*

\* “ Ce systeme est aussi celui des Brames de nos jours; il fait  
 “ la Base de la religion qu’ils ont apportee dans le sud la pres-  
 “ qu’isle de l’Indostan, la Madure, le Tanjaour, et le Maissour.



M. *Gentil* then goes on to say a good deal more upon this subject, in the course of which he supposes, that this Deity is the *Fo* of the *Chinesse*, whose worship, by their own accounts, was brought from *India*. And, indeed, the abridgement of the name *Pout*, mentioned in a note of this paper, which the vulgar *Siamese* reduce to the single syllable *Po*, seems to countenance this opinion. But as this is foreign to our present purpose, and the above passages, it is hoped, are sufficient to establish what was proposed, it seems high time to take leave of this subject, with an apology for that prolixity which is inseparable from this kind of discussion.

17th June, 1784.

VI.

“ Il y avoit alors dans ces parties de l’Inde, et principalement a  
 “ la Côte de Coromandel & a Ceylan, un culte dont on ignore ab-  
 “ solument les dogmes; le Dieu Baouth, dont on ne connoit au-  
 “ jourd’hui, dans l’Inde, que le nom, étoit l’objet de ce culte;  
 “ mais il est tout-à-fait aboli, si ce n’est qu’il se trouve encore quel-  
 “ ques familles d’Indiens séparées & méprisées des autres Castes,  
 “ qui sont restées fideles à Baouth, & qui ne reconnoissent point  
 “ la religion des Brames.

“ Je n’ai pas entendu dire qu’il y ait de ces familles aux envi-  
 “ rons de Pondichery; cependant, une chose tres digne de remar-  
 “ que, & à laquelle aucun des voyageurs qui parlent de la Côte  
 “ de Coromandel & de Pondicherry, n’ont fait attention, est que  
 “ l’on trouve a une petite lieue au sud de cette ville, dans la plaine  
 “ de Virapatnam, assez pres de la riviere, une statue de *Granit*  
 “ tres-dur & tres-beau: cette statue, d’environ trois pieds & demi  
 “ de hauteur, est enfoncée dans le sable jusqu’à la ceinture, & pese  
 “ sans doute plusieurs milliers; elle est comme abandonnée au  
 “ milieu de cette vast plaine: je ne peux mieux en donner une  
 “ idée, qu’en disant qu’elle est exactement conforme & ressem-  
 “ blante a *Sommonacodom* des Siamois; c’est la même forme de  
 “ tête, ce sont les mêmes traits dans le visage, c’est la même atti-  
 “ tude dans les bras, & les oreilles sont absolument semblables. La  
 “ forme de cette divinite, qui certainement a été faite dans le pays,  
 “ & qui ne ressemble en rein aux divinités actuelles des Gentils,  
 “ m’avoit frappé lorsque je passai dans cette plaine; je fis diverses  
 “ informations sur cette figure singuliere, les Tamoultz m’assure-  
 “ rent tous que c’étoit Baouth qu’on ne regardoit plus; que son  
 “ culte & ses fêtes étoient cessées depuis que les Brames s’étoient  
 “ rendus les maîtres de la croyance du peuple.”

## VI.

## H I N T S

RELATIVE TO

## FRICTION IN MECHANICS.

BY MR. REUBEN BURROW.

## HYPOTHESIS.

**I**N the following estimation of friction, the weight or force necessary to overcome the resistance, &c. is supposed to be proportional to the pressure.

## OF FRICTION IN THE INCLINED PLANE.

Let  $AB$  be an inclined plane,\* and let  $PR$  represent a weight sustained on it by any force  $Rm$ , acting in the direction  $Rm$ : and draw  $PD$  perpendicular to  $AB$ , and let  $Rm$  meet  $PD$  in  $n$ : Now as  $Rn$  represents the force that would be necessary to sustain the body, exclusive of friction, and  $Pn$  represents the pressure against the plane, if  $mt$  be drawn perpendicular to  $PD$  meeting it in  $t$ , then will  $nm$  be the force necessary to overcome the friction in that direction, and  $Pt$  the real pressure against the plane  $AB$ , when the whole force  $Rm$ , necessary to overcome both the weight and the friction, acts in the direction  $Rm$ ; and as the force  $nm$  is equivalent to  $nt$  and  $tm$ , and  $nt$  has no other effect than to alter the pressure, therefore  $tm$  is the only force which overcomes the resistance of friction; and as this force is as the pressure, therefore  $tm$  is proportional to  $Pt$ , and hence the locus of all the points  $m$  is a right line.

O 2

Again,

\* Fig. 1.



Again, suppose the body, instead of being drawn along, to be sustained at rest only upon the plane; this, it is evident, will require a less force than the other, because the friction prevents the body in part from descending.\* Let  $R_m$  be the force required, and let the same construction be made as before; then because  $R_n$  is the force that would be necessary if there was no friction,  $mn$  is the effect of the friction itself; but  $mn$  is equivalent to the forces  $mt$  and  $tn$ ; and as  $P_n$  would be the pressure exclusive of friction,  $P_t$  is the pressure inclusive; and as the force lost is as the friction, and  $mt$  is as the force lost, therefore  $mt$  is as  $P_t$ , for the friction is as the pressure; consequently the locus of all the points  $m$  is a right line passing through  $P$ , and making the same angle as  $DPQ$  in the former case, and only differing by being drawn on the contrary side of  $PD$ .

### SCHOLIUM.

In what follows, the force requisite to sustain any body is considered under three different distinctions. First, when it is just barely sufficient to overcome the weight and resistance arising from friction, and the body is considered as just beginning to move in the direction of the force applied, and the force in this case is called the *moving force*: secondly, when this force is diminished till the body would begin to move or descend in a contrary direction if the force was diminished farther; this last I call the *suspending force*: and it is plain that whatever force is applied to the body less than the moving, and greater than the suspending force, the body will remain at rest: lastly, it is manifest that there is an intermediate state, in which such a degree of force may be applied, that the friction will have no effect either way; and this force is the same as would keep the body in equilibrio if there was no friction, because the effect or tendency of

\* Fig. 2.

of friction is to keep the body at rest, or prevent it from moving either way: this being premised, there will be little difficulty in the following.

### PROBLEM I.

Having given the weight of the body to be sustained, the inclination of the plane, and the ratio of the friction to the pressure; to find the force requisite to sustain the weight in a given direction.

In the foregoing figures, draw  $PR$  and  $PD$  at right angles to the horizon and plane respectively,  $PR$  representing the weight; take  $PD$  to  $DQ$  as the pressure to the friction, and let  $DQ$  be taken upwards or downwards as the requisite force is motive or suspensive; join  $PQ$ , and draw the line  $Rm$  in the given direction meeting  $PQ$  in  $m$ ; then  $Rm$  is the force required.

Corollary 1. If the friction be the  $n$  part of the pressure, and  $W$  be the weight,  $s$  and  $c$  the sine and cosine of the plane's elevation, then the moving force parallel to the plane will be  $W (s + c : n,)$  and the suspending force  $W (s - c : n.)$

Corollary 2. If the direction of the force be parallel to the horizon, and  $t$  be the tangent of the plane's elevation, then  $W (tn + 1) : (n - t)$  will be the moving force, and  $W (tn - 1) : (n + t)$  the suspending force, and  $Wt$  the force excluding friction.

Example. If the weight be a ton, the friction  $\frac{1}{3}$  of the pressure,  $AB = 5$ ,  $BC = 3$ , and  $AC = 4$ , then the moving force will be 3235 pounds, the suspending force



force 747 pounds, and the force excluding friction 1680 pounds; nearly.

## PROBLEM II.

Given the weight of the body, the inclination of the plane, and the ratio of the friction to the pressure; to find the direction so that the sustaining force may be a given quantity, or the least possible.

Draw  $DQ$  and  $QP$  as before, and let  $PR$  be to  $Rm$  as the weight to the given force; then from the center  $R$ , with a distance equal to  $Rm$ , intersect  $PQ$  in  $m$ ; then  $Rm$  is the required direction when the force is given; but to have it the least possible, draw  $Rm$  at right angles to  $PQ$ , then  $Rm$  is the direction required.

Corollary 1. An expression for the sustaining force when the least possible, may be found as follows: In the triangles  $PDQ$ ,  $RQm$ , the angle  $Q$  is common, therefore  $PQ:PD::RQ:Rm$ ; but  $PD$  is a fourth proportional to  $AB$ ,  $AC$ , and  $PR$ , and  $DQ$  is to  $PD$  as 1 to  $n$ , supposing this the given ratio; also  $RD$  is a fourth proportional to  $AB$ ,  $BC$ , and  $PR$ , consequently  $RQ$  is equal to  $DQ$  either added to or subtracted from  $DR$ , as it is the first or second case; and because  $PQ:PD::\sqrt{nn+1}:n::RQ:Rm$ , therefore  $Rm = PR (n. BC \pm AC) : A\sqrt{nn+1}$  or  $(ns \pm c) W : (\sqrt{nn+1})$  by substituting  $s$  and  $c$  for the natural sine and cosine of the plane's elevation, and using the negative or affirmative sign as the force required, is the moving or suspending one respectively.

Example.

Example. If  $AB=5$ ,  $BC=3$ , and  $AC=4$ , and the weight 1 ton, then the least moving and sustaining forces will be 1825 and 702 pounds respectively.

Corollary 2. Because the triangles  $PDQ$  and  $RQm$  are similar, and the ratio of  $PD$  to  $DQ$  constant to each fixed value of  $n$ , therefore the angle  $QRm$  being equal to  $DPQ$ , will also be constant, whether the inclination of the plane be variable or not; and hence the angles of the direction with the plane for the draught to be made with the greatest advantage, are found for different values of  $n$  as follows:

n	QRm	n	QRm	n	QRm	n	QRm	n	QRm	n	QRm
1	45.0	2	26.34	3	18.26	4	14.2	5	11.19	6	9.28
$1\frac{1}{4}$	38.40	$2\frac{1}{4}$	23.58	$3\frac{1}{4}$	16.54	$4\frac{1}{4}$	13.15	$5\frac{1}{4}$	10.47	7	8.8
$1\frac{1}{2}$	33.41	$2\frac{1}{2}$	21.48	$3\frac{1}{2}$	15.57	$4\frac{1}{2}$	12.32	$5\frac{1}{2}$	10.18	8	7.8
$1\frac{3}{4}$	29.45	$2\frac{3}{4}$	19.59	$3\frac{3}{4}$	14.56	$4\frac{3}{4}$	11.53	$5\frac{3}{4}$	9.52	9	6.20

N. B. The direction, or angle  $QRm$ , is to be taken below the plane for the suspending, and above the plane for the moving force.

Scholium. Though at first sight the former part of the above Problem, which shews the best method of applying an active force, seems superior to the other, yet, on farther consideration, the other appears of equal consequence, and particularly in building and fastening walls, banks of earth, fortifications, &c. and the application of what are called *land-ties*, &c. Thus if a weight, for instance, is to be drawn along the plane  $RB$ , and the friction be  $\frac{1}{3}$  of the pressure, the best direction is when  $Rm$  makes an angle of  $18^\circ. 26'$  above the plane; but if the weight is a quantity of earth or stone, or any thing



to be suspended, as in the case of land-ties, the best angle (on the foregoing supposition) must be  $18^{\circ}.26'$  below the plane.

### SCHOLIUM.

In those propositions the friction is estimated according to the most generally received opinion, that the resistance is proportional to the whole pressure compounded of the weight of the body, and the additional force necessary to overcome the friction; but it has been asserted, that there may be cases where the friction is not proportional to the whole pressure, but to that which would arise if the body was sustained in a given direction, exclusive of friction; and that there might also be cases, where the resistance, arising from tenacity or cohesion, might be as the relative pressure against the plane, and the force to overcome it the same in every direction; something similar to a globe stuck fast in wet tenacious clay: I shall therefore give solutions to both cases.

In the first case,\* the force requisite to sustain the body in direction  $RV$ , exclusive of friction, is  $Rn$ ; and as  $Rn$  is equivalent to  $RD$  and  $Dn$ , therefore  $Pn$  is the pressure, exclusive of friction; and as the friction is the  $n$  part of the pressure, the force acting parallel to  $AB$  to overcome it, is the  $n$  part of  $Pn$ ; but the force which acting in direction  $Rn$  will be equivalent to the  $n$  part of  $Pn$  in the direction  $Rn$ , is a fourth proportional to  $n$  times  $RD$ ,  $Pn$ , and  $Rn$ ; but because  $DQ$  is the  $n$  part of  $DP$ , therefore  $fn$  is the  $n$  part of  $Pn$ , and the fourth proportional aforesaid will be  $nz$ ; consequently the sum or difference of  $Rn$  and  $nz$  must be a given quantity, or the least possible: the Problem therefore is reduced † to drawing a line  $Rn$  from the given point  $R$ , meeting the two lines  $PD$  and  $PQ$  given in position

\* Fig. 3.

Fig. 4.

tion in  $n$  and  $z$ ; so that  $nz$  added to or taken from  $Rn$ , the sum or difference may be a given quantity, or the least possible. To do this, let  $DS$  be taken equal to  $DR$ , and draw  $SR$  parallel to  $PD$  meeting  $PQ$  in  $M$ ; then because  $Rn$  is equal to  $rn$ , the sum or difference of the quantities aforesaid is  $rz$ ; and when  $rz$  is required to be a given quantity, the question is reduced to that particular case of the inclinations of APOLLONIUS, in solids, which has been resolved by NEWTON and BARROW: the limits of the Problem, or the mode of drawing the line  $Rr$ , so that the intercepted part  $rz$  may be the least possible, may be investigated as follows:

\* Suppose it done, and  $Rrz$  the position required, and let  $Rnm$  be indefinitely near to  $Rz$ , and  $Mh$  perpendicular to  $Rz$ , then by applying the analysis of the ancients to the *Newtonian* doctrine of prime and ultimate ratios,  $mn$  is equal to  $zr$ ; and if from the center  $R$ , with the distances  $Rz$  and  $Rn$ , the arcs  $zv$  and  $nt$  be supposed to be described,  $vn$  is equal to  $zt$ , and consequently  $tr$  equal to  $mv$ ; but  $rt : tn :: rh : Mh$ , and  $tn : zv :: Rr : Rz$ , and  $zv : vm :: Mh : hz$ , whence by compounding the proportions,  $tr : vm :: Rr : rh : Rz : zh$ , and as the two first terms are equal, the two last are equal, and consequently  $Rr : Rz :: zh : rh$ , and dividing  $Rr : rz :: zh : rz$ , therefore  $Rr$  is equal to  $zh$ , and consequently the point  $h$  is in an hyperbola, whose asymptotes are  $QM$  and  $SM$  produced: but because the angle  $MhR$  is a right angle, the point  $h$  is also in the circumference of a circle; therefore a line drawn from  $R$  to  $h$ , the point where the hyperbola and circle intersect, is the position required.

In the other case, where the resistance arising from tenacity or cohesion is supposed to be as the relative pressure against the plane, and the force to overcome it  
the



the same in each direction, we have  $Rn$  for the sustaining force, exclusive of friction, and the  $n$  part of  $Pn$  for the friction; and consequently the sum or difference of these is the expression for the whole force; and the Problem may be thus constructed. Take  $PD$  to  $DQ$  as the pressure to the friction, and join  $PQ$ ; on  $PD$  describe a circle, in which take  $Dv$  equal to  $DQ$ ; join  $Pv$ , and draw  $RV$  perpendicular to it: then  $RV$  will represent the direction and measure of the whole force when it is the least possible.

For  $DQ$  and  $Dv$  are equal, and consequently  $nf$  is equal to  $Vn$ ; but  $DQ$  is the  $n$  part of  $DP$ , therefore  $nf$  or  $Vn$  is the  $n$  part of  $Pn$ ; and consequently  $RV$  is equal to the sum or difference of  $Rn$ , and the  $n$  part of  $Pn$ ; but  $RV$  is the least possible by construction, and therefore the other is a minimum also. For draw any other line  $Rk$  meeting  $RV$  in  $k$  and  $PD$  in  $m$ ; and draw  $mq$ ,  $mt$ , parallel to  $DQ$  and  $Dv$ ; then the sum or difference of  $Rm$  and  $mt$  is equal to the sum or difference of  $Rm$ , and  $mq$ ; but the sum or difference of  $Rm$  and  $mt$  is greater than  $RV$ , and therefore the sum or difference of  $Rn$  and the  $n$  part of  $Pn$  is the least possible.

### P R O B L E M III.

Given the weight of the body, the inclination of the plane, and the force sustaining the body in a given direction: to find the ratio of the friction to the pressure.

Take  $PR$  as before, (see Fig. 1. 2.) draw  $Rm$  in the given direction, and take  $PR$  to  $Rm$  as the weight of the body to the force sustaining it; draw  $Pm$  meeting  $AB$  in  $Q$ , and  $PD$  perpendicular to  $AB$ ; then  $PD$  is to  $DQ$  as the pressure to the friction.

## P R O B L E M IV.

If AhqN be the segment of an equilateral triangle, which, by moving parallel to itself and the horizon, generates a solid, upon which a figure hmGEHKpqh moves, touching the former in hm and qp; required the effect of the friction; still supposing it the  $n$  part of the pressure.

Let P be the center of gravity of half the body\*, and PR its weight as before; then the body by means of its inflexibility is kept together in the same manner as if it was actuated by a force parallel to the horizon; but if PDn be perpendicular to Ah, and Rn parallel to the horizontal line AC, meeting PD in n, Pn will be the pressure against the side Ah, and the friction is the  $n$  part of Pn; but  $PR : Pn :: AC : AB$ ; therefore if AC represent the weight of half the body, the  $n$  part of AB will express the weight requisite to overcome the friction for that half; and by doubling the expressions, they serve for the whole. Wherefore let W represent the weight of the body,  $f$  the secant of the angle BAC; then  $Wf$  will be the pressure against the plane AD; and the  $n$  part of  $Wf$  the force necessary to overcome the friction; and as this last is the force necessary to draw the body along a horizontal plane, therefore the force necessary to draw the body along a horizontal plane, is to that necessary to draw it along the body whose section is AhqN, as AC to AB, or as 1 to  $f$ .

Because when the angle CAB is given, the ratio of PR to Pn is constant; therefore when the solid whose section is AhqN is elevated, making an angle with the horizon, so that its base forms an inclined plane; PR in that case represents the pressure in a normal direction to that plane, and Pn the pressure against the solid; and

as

\* Fig. 7.



as the friction is increased in the ratio of the pressure, therefore if the pressure which the body would have on the inclined plane be increased in the ratio of AC to AB, or radius to the secant of the angle CAB, then the pressure on the angular plane or body, whose perpendicular section is AhqN, will be had, and consequently its  $n$  part, or the friction. Hence this construction\*; let PR represent the weight; then PD at right angles to AB represents the pressure that the body would exert against the common inclined plane; take DK to DP as AB in the foregoing figure to AC, or as the secant of the inclination of the angular plane with its base to radius; let Dq be the  $n$  part of DK, and join Kq; then RM drawn any how to meet Kq in M, gives RM for the measure of the whole force in that direction; and it is the moving or suspending force, according as Dq is taken upwards or downwards in the line AB.

It is evident that Kq is parallel to PQ, and therefore though the least force (which is perpendicular to Kq) differ from that in the former cases; yet the directions for having the greatest effect are still the same as in the foregoing table; the demonstration is in effect the same as the first.

Corollary. By supposing  $s$  to be the secant of the angle  $\dagger$  that the sides of the angular plane make with the base, proceeding as Corollary 2d of Problem 1st, and putting  $t$  for the natural tangent of the plane's inclination, and  $W$  for PR the weight, we have  $W (tn+f) : (n-t)$  for the moving; and  $W (tn-f) : (n+t)$  for the suspending force, necessary to draw the body along the angular inclined plane by a force acting parallel to the base of the plane.

Example.

\* Fig. 5.

† Fig. 8.

Example. Let AB, BC, and AC, be 5, 3, and 4, respectively, and let the inclination of the sides be  $45^\circ$ ; the weight of a ton and the friction one third of the pressure; then 3648 pounds is the moving, and 499 the suspending force.

### SCHOLIUM.

In this proposition, those parts of the plane on which the body moves are supposed rectilinear, as mostly happens in practice; but the friction is easily estimated in curvilinear surfaces, and may be found generally as follows:

Let AMP\* be half the section perpendicular to the horizon, and to the axis of the solid which forms the curvilinear plane on which the body is moved; AP the axis; PM the ordinate, and MS a tangent to the curve at the point M; also let RM represent the weight or pressure in a direction perpendicular to the horizon at the point M; and let RF be perpendicular to MS meeting MP in F; also let PN be taken equal to MR, and PQ equal to RF; and suppose the same construction to be made for every point of the curve, and let HN be the locus of all the points N, and GQ the locus of all the points Q; then will the friction, when drawn along the horizontal plane, be to the friction of the same body when drawn along the curvilinear plane in the same direction, as the area APNH to the area APQG.

For the friction on the horizontal plane being as the sum of the pressures, is as the sum of all the elementary lines MR or PN; that is, as the area AHNP; and the friction on the curvilinear plane is for the same reason as the

\* Fig. 9.



the sum of all the  $RF$  or  $PQ$ , namely, as the area  $APQG$ ; hence the truth of the proposition is manifest.

Corollary 1. Because  $Mn$  or the fluxion of  $y$  is to  $Mm$  the fluxion of the curve, as  $MR$  or  $PN$  to  $RF$  or  $PQ$ , therefore if  $PN$  be a function of  $AP$ ,  $PQ$  will be a fourth proportional to the fluxion of the ordinate, the fluxion of the curve  $AM$ , and this function; wherefore if the curves  $HN$  and  $AM$  be given, the nature of the curve  $GQ$  will be known, and its area may be found by the common methods of quadratures.

Corollary 2. It is evident that when the planes are inclined to the horizon, the frictions of the right and curvilinear planes are still in the same ratio as in the preceding cases, and consequently may be found by the same mode of proceeding.

Corollary 3. It is also evident, that the above method holds good whether the parts of the body are connected together or not, with respect to their motion in the direction  $RM$ , so long as each elementary part  $MR$  may be considered as sustained at the point  $M$  by a force parallel to  $MP$ ; but when the body is rigid or inflexible, the case becomes more simple, for  $MR$  is then constant, and  $APNH$  becomes a parallelogram.

Corollary 4. By supposing given properties to exist in any two of the curves  $AM$ ,  $HN$ , or  $GQ$ , the nature of the third will be known; and hence a number of problems relative to friction may be proposed and resolved by a proper application of the direct and inverse methods of fluxions.

## PROPOSITION

## PROPOSITION 5. THEOREM.

In the application of forces to overcome friction, the same allowances must be made for the forces acting to advantage or disadvantage, by means of levers or other mechanical powers, as are made in the common doctrine; for instance, if a weight of two pounds, by acting at the distance of one foot from the fulcrum of a lever, be sufficient to overcome the friction, then one pound at two feet distance will have the same effect, &c.

This is too evident to need a demonstration.

## OF FRICTION IN THE SCREW.

As any force acting perpendicular to the direction of a moving body does not affect the motion of the body in that direction, so the force acting perpendicular to the axis of the screw, has no effect on the motion of a body raised thereby, exclusive of friction; it therefore requires the same force to raise a body by means of a screw, as to raise the same body in equal time along an inclined plane of the same elevation, as the threads of the screw by means of a force acting parallel to the base of the inclined plane: now, if we suppose the weight so contracted or condensed as to be capable of being placed on one of the threads of the screw, and fastened to an imaginary lever always perpendicular to its axis, then it is evident this lever will have no effect but to change the direction of the weight, and keep it in the midst of the thread of the screw; and if a force be applied at the weight always perpendicular to this lever, so as to sustain or draw it along, this force will be determined exactly the same as was done before in the inclined plane: but the rigidity of the parts of the “female screw”



screw" serves exactly the same purpose as this imaginary lever, and makes the weight act upon the threads like a body sustained on an inclined plane by a force parallel to its base; and as the force to overcome both the weight and the friction is reciprocally as the distance from the center of the axis, therefore the distance of the power from the center of the axis, is to the distance from the same center to the middle of the threads of the screw, as the force necessary to sustain the body on the inclined plane, to the same force in the screw at the distance of the power. The same proportion holds good whether the threads be cut perpendicular to the axis or in an angle; for in the first, the common plane is to be taken; and in the second, the inclined or angular one, considered in the fourth Proposition: Wherefore if  $d$  be the distance from the center of the axis to the middle of the threads of the screw,  $D$  the distance of same center to the point where the force is applied, the force to overcome the weight and friction is  $Wd (tn \pm f) : (n \mp t) D$ , where the letters express the same things as before, and the upper sign is for the moving, and the lower for the suspending force. N. B.  $t$  is the natural tangent of the angle made by a line touching one of the threads, and a plane at right angles to the axis of the screw; or it is equal to the distance of the respective edges of two threads, divided by the circumference of the cylinder, out of which the screw is cut.

Corollary 1. When lines drawn from the center of the axis of the screw to coincide with the threads, are at right angles to the axis, the above expression becomes  $Wd (tn \pm 1) : (n \mp t) D$ , for  $f$  becomes radius or unity.

Corollary 2. When  $n$  is equal to  $t$ , the moving force will be infinite; also the suspending force will be nothing





## 1

thing when  $t$  is the  $n$  part of  $s$ ; and when  $Wd (tn-s) : (n+t)$   $D$  becomes negative, it expresses the quantity of force which must act in a contrary direction to reduce the body just to a state of suspension.

### SCHOLIUM.

It would be needless to make any allowance for the curvilinear surfaces of the threads of screws, as they seldom differ much from the two foregoing forms; neither is it of much consequence to allow for their parts being at different distances from the axis, as their breadth seldom bears any considerable ratio to the length of the levers by which they act; but the case is different when large bodies revolve on each other, and therefore it will be necessary to shew the mode of proceeding in such cases.

Let  $MmAQ$  be a convex solid,\* generated by the revolution of the curve  $MAQ$  about its axis perpendicular to the horizon, and  $MRSQ$  a concave body exactly fitting it: then if this last body be revolved about the axis  $AP$  by means of the lever  $Pf$ , the force necessary to overcome the friction of one body turning upon the other may be found as follows. Suppose the revolving body divided into an infinite number of concentric tubes, that may descend independent of each other, and press freely against the body on which they revolve, and yet be so connected that the lever  $Pf$  may give the same angular velocity at the same time to each; also let the ordinates  $PN$  of the curve  $HN$  represent the weight or pressure (in a direction perpendicular to the horizon) of each of the indefinitely small parts  $Mk$ , or elementary lines of the body at the distance  $PM$  from

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the

\* Fig. 10.



the axis, and let  $c$  be the circumference of a circle whose radius is unity: then because the friction of each of the elementary tubes  $MRSQ$  is as its pressure, and the pressure is as the number of lines  $Mk$ , and the pressure of each; therefore as this number is as  $PM.Mn.c$ , we have the  $n$  part of this expression for the force which, acting at  $M$ , would overcome the friction of the cylindrical tube if moved round upon a horizontal plane: but as the pressure of each elementary part is increased in the ratio of  $Mn$  to  $Mm$ , when moved on the solid  $MAQ$ , the real force will be  $(PM.c.Mm.PN):n$ ; also  $Pf:PM:: (PM.c.Mm.PN):n$  to the small elementary force which will overcome the last force when acting at  $f$ ; consequently the whole force will be equal to the fluent of  $(PM^2.PN.Mm.c):(n.Pf.)$

Corollary. By means of the curves  $AM$ ,  $HN$ , &c. conclusions may be drawn similar to those in the Corollaries to the Scholium of the fourth Proposition.

## OF FRICTION IN THE LEVER.

It has been already observed, that a force acting perpendicular to the direction of a body in motion, does not alter the body's motion in that direction; therefore if\* we suppose  $DB$  to be an upright cylinder, and  $AB$  a body touching it in a line as in the figure, and retained close to it by an imaginary force, drawing it perpendicular towards the axis; then if a force  $CP$  be applied to  $C$ , the center of gravity of  $AB$ , and be always supposed to act perpendicularly to the radius  $CN$ , drawn from the center of the axis to the point  $C$ , the friction will be the same in drawing the body round the cylinder, as in drawing it along a horizontal plane with an equal pressure; and if it be moved round by a force acting at a greater distance, the force will be reciprocally as the distance:

\* Fig. 11.

distance: on the contrary, if the body AB be fixed, and the cylinder turned round about its axis, the friction will be the same as if the cylinder was fixed, and the body drawn round it by CP, as before: Likewise the friction is the same, whether the cylinder be fixed, and the body AB moved round the axis MR by a force Qc applied at c; or whether the point c be fixed with AB fastened to Cc, and the cylinder be revolved in a circle whose center is c, so as always to retain its parallelism with respect to any fixt object; and as this last case obtains in the axletrees of carriages, since every point of the wheel's contact with the ground may be considered as the center of motion for that instant, therefore the effect of the resistance arising from the friction of the concave part of the nave upon the axletree, is to the effect that would arise from drawing the same weight over a horizontal plane of the same kind, as the parts that rub each other, as the radius of the axis to the radius of the wheel. It must be observed, that this is not the only friction to which carriages are subject; for there is another part, arising from the cohesion of the wheel and the ground at their contact, which is to be found and allowed for by the three first Propositions.

In the above the pressure and friction have been supposed to be as the weight, as it is on a horizontal plane; but by the Scholium to the fourth Proposition, it is plain that the pressure is greater than the weight, and may be so in any proportion: however, as it appears by calculation, that the pressure on an arc of ninety degrees is to that on its chord, only as 1,183 to 1, when both the concave and convex parts have exactly the same curvature, the difference will be so trifling when the cylinders have different curvatures as usual, as to require very seldom to be allowed for.



This being premised, let  $M^*$  be a weight placed at the point  $A$  of a lever, moveable about an axis whose center is  $d$ , and radius  $dn$ ; and let  $N$  be the sustaining force acting at  $B$ : now it is evident that the pressure on the axis  $d$  differs so little from the weight, that it may be safely taken for it without any considerable error, except in some remarkable cases, which may be allowed for from what has been said already; and therefore the friction which ought in strictness to be taken as the  $n$  part of the pressure, will here be taken as the  $n$  part of the weight upon the axis. Now if  $N$  be taken for the force which, acting at  $B$ , would be just sufficient to keep the weight  $M$  at  $A$  in equilibrio, exclusive of friction, and if  $W$  be the additional force to be added to  $N$  so as to overcome the friction, then will  $M + P$ ,  $M - P$ , and  $P - M$ , be the weight upon the axis at  $d$  in the first, second, and third figures respectively, (supposing the sum of  $M$  and  $N$  to be equal to  $P$ .) Now as the friction is the  $n$  part of each of these quantities, and its effect is to keep the lever in a state of rest, therefore in whatever direction the force at  $N$  endeavours to draw the lever by acting at  $B$ , the friction tends to counteract that force by keeping the lever steady, or acting in a contrary direction at  $n$ ; and as the effect of the friction, and the additional force  $W$ , are in equilibrio, and the friction acts by means of the lever  $dn$ , and the force  $W$  by the lever  $dB$ ; therefore  $Bd$  is to  $dn$  as the sum or difference of the  $n$  part of  $N + W$  and  $M$  is to  $W$ ; consequently  $W = dn (M + N) : (n. Bd - dn,)$  in the first figure;  $W = dn (M - N) : (n. Bd + dn,)$  in the second figure; and in the third figure,  $W = dn (N - M) : (n. Bd - dn.)$  All these are the expressions for the moving forces.

To find the suspending forces, or the forces which, acting at  $N$ , shall be just sufficient to prevent the weight  $M$  from descending: Let  $M$  and  $N$  be the same as before, and let  $w$  be the force which, taken from  $N$ , will leave  
a force





# A SYNOPSIS OF THE DIURNAL AND SEPTENARY CHANGES OF THE BAROMETER.

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
A. M.	I	29.97 .97 .97	29.99 .97 .97	29.93 .93 .93	29.85 .85 .85	29.94 .94 .94	29.97 .97 .97	30. 2 . 2 . 0	29.85 .85 .94	29.89 .87 .86	29.86 .86 .86	29.83 .83 .83	29.79 .79 .79	29.86 .84 .83	29.81 .89 .90	29.92 .92 .90	29.85 .85 .85		29.91 .91 .88	29.90 .90 .88		29.78 .78 .78	29.84 .84 .84	29.81 .85 .85	29.85 .85 .85		29.81 .81 .81	29.82 .84 .84	29.85 .83 .83			
	II	.97 .96 .95				.94 .94 .92		. 0		.86		.83 .83 .83		.83 .83 .89			.85			.88 .79 .88	29.80 .79 .88		.88 .80 .80	.84 .88 .88	.85 .85 .85		.84 .84 .81	.81 .84 .81	.84 .83 .83	29.80 .80 .80		
	III	.96 .95 .95		.92		.92 .92 .92	.94 .94 .94				.84 .83 .83						.85	29.79 .79 .79	.88 .88 .88			.80 .80 .78	.85 .88 .85	.88 .88 .88	.84 .84 .88		.81 .81 .81	.84 .84 .81	.83 .83 .81	29.80 .80 .80		
	IV	.95 .95 .95	.97 .97 .97		.85 .85 .85			.98 .98 .98	.92 .92 .92		.83 .83 .83				.83 .83 .83	.89 .89 .89					.87 .87 .87	.79 .79 .79	.78 .78 .78		.85 .85 .85	.88 .88 .88		.81 .81 .81				
	V		.97				.94 .94 .94	.98 .98 .98	.92 .92 .92	.86 .86 .86			.79 .79 .79				.84 .84 .84	.79 .79 .79					.80 .80 .80		.84 .84 .84	.81 .81 .81		.86 .86 .86	.83 .83 .83			
	VI					.94 .94 .94			.92 .92 .92		.83 .83 .83	.83 .83 .83	.79 .79 .79	.84 .84 .84	.88 .88 .88	.88 .88 .88	.84 .84 .84		.88 .88 .88	.86 .86 .86	.79 .79 .79		.85 .85 .85	.88 .88 .88		.88 .88 .88		.85 .85 .85	.88 .88 .88	.83 .83 .83	.80 .80 .80	
	VII		.97		.85 .86 .88	.94 .94 .96	.98 .98 .98	30. 1 . 2 . 3	.94 .94 .94	.90 .90 .90	.88 .88 .88	.83 .83 .83	.79 .79 .85	.81 .88 .85	.88 .95 .98	.89 .89 .97	.83 .83 .83		.88 .90 .96	.86 .86 .88	.81 .81 .85	.78 .79 .82		.85 .87 .88	.88 .88 .88	.92 .92 .94		.85 .88 .87	.86 .90 .93	.84 .84 .84	.80 .80 .80	
	VIII	30. 1 . 3 . 3	30. 1 . 2 . 3	.91 .91 .91	.90 .90 .90	.99 .99 .99			.4 .4 .4	.96 .96 .96	.93 .93 .93	.90 .90 .90	.83 .82 .82	.85 .90 .90	.99 .94 .94	.93 .94 .94	.84 .84 .84	.85 .84 .84		.98 .98 .98	.89 .89 .90	.87 .87 .88	.85 .85 .85	.88 .88 .88	.90 .90 .90		.92 .92 .92	.90 .90 .90	.93 .93 .93	.85 .86 .86	.80 .82 .82	
	IX	. 3 . 4 . 4	. 3 . 4 . 4	.94 .94 .94	.91 .93 .93	30. 30. 30.	30. 1 . 1 . 1	.4 .4 .5	.96 .96 .96	.93 .93 .93	.93 .93 .93	.82 .82 .81	.88 .88 .88	.90 .92 .92	.30 .30 .30	.94 .94 .95	.84 .84 .84	.86 .86 .86	.98 .95 .95	.90 .90 .90	.88 .88 .89	.85 .85 .85	.89 .89 .89	.94 .94 .94	.96 .96 .96	.93 .93 .93	.90 .90 .90	.92 .92 .92	.94 .94 .94	.87 .87 .87	.82 .82 .82	
	X	. 4 . 4 . 4	. 4 . 4 . 4	.94 .94 .94	.94 .94 .94	30. 30. 30.	. 1 . 1 . 1	.5 .5 .3	.96 .96 .96	.93 .93 .93	.93 .93 .93	.81 .81 .81	.88 .88 .88	.92 .92 .92	.30 .30 .30	.95 .95 .95	.84 .84 .84	.86 .86 .86	.95 .95 .95	.88 .88 .88	.87 .87 .87	.83 .83 .83		.89 .89 .89	.93 .93 .93	.98 .98 .98	.90 .90 .90	.92 .92 .92	.94 .94 .94	.87 .87 .87	.83 .83 .83	
	XI	. 4 . 4 . 4	. 2 . 2 . 2	.94 .94 .94	.94 .94 .94	30. 30. 30.	. 1 . 1 . 1		.93 .93 .93		.89 .89 .89	.80 .80 .80	.90 .90 .90	.92 .92 .92	.97 .97 .97	.93 .93 .93	.84 .84 .84	.86 .86 .86	.95 .95 .95	.87 .87 .87	.83 .83 .83		.86 .86 .86	.87 .87 .87	.94 .94 .94	.96 .96 .96	.93 .93 .93	.90 .90 .90	.92 .92 .92	.94 .94 .94	.86 .86 .86	.82 .82 .82
	XII	. 2 . 2 . 2	. 2 . 2 . 2	.94 .94 .94	.94 .94 .94	30. 30. 30.	. 1 . 1 . 1	. 1 . 1 . 1	.93 .93 .93		.87 .87 .87	.80 .80 .80	.90 .90 .90	.90 .90 .90	.95 .95 .95	.93 .93 .93	.84 .84 .84	.86 .86 .86	.82 .82 .82	.85 .85 .85		.86 .86 .86	.87 .87 .87	.92 .92 .92	.96 .96 .96	.89 .89 .89		.90 .90 .90		.85 .85 .85		
P. M.	I	30. 1 29.99 .97	30. 29.97 .96	29.92 .91 .91	.94 .90 .89	29.96 .94 .93	29.89 .87 .86	30. 1 29.99 .95	.93 .93 .91	.90 .86 .86	29.84 .85 .85	.80 .79 .77	.89 .86 .82	.89 .87 .85	.95 .92 .90	.89 .89 .87	.84 .84 .83	.84 .82 .80		.81 .82 .88		.85 .82 .79	.85 .80 .80	.90 .90 .90		.87 .85 .83		.90 .86 .82	.83 .83 .81	.80 .80 .80		
	II	.97 .97 .96	.96 .95 .94	.91 .89 .88	.90 .89 .88	.94 .93 .92	.86 .84 .84	.89 .89 .89	.85 .85 .85	.85 .85 .85	.85 .85 .85	.77 .77 .77	.82 .82 .78	.84 .84 .82	.89 .88 .88	.87 .87 .87		.80 .80 .82	.86 .82 .80		.82 .82 .79	.80 .80 .79	.80 .80 .79	.90 .88 .88	.90 .88 .85	.83 .83 .81	.81 .81 .81	.83 .83 .83	.81 .81 .81	.80 .80 .80		
	III	.96 .93 .93	.94 .93 .86	.88 .88 .86	.88 .88 .88	.92 .90 .86	.84 .84 .84	.91 .91 .91	.85 .85 .85	.85 .85 .85	.84 .84 .84		.78 .78 .78	.84 .82 .82	.88 .88 .88	.87 .87 .87		.80 .80 .82	.80 .80 .80		.82 .82 .79	.80 .80 .79	.80 .80 .79	.88 .87 .85	.88 .85 .85	.83 .81 .81	.81 .81 .81	.83 .83 .83	.81 .81 .81	.80 .80 .80		
	IV	.96 .93 .93	.93 .93 .86		.88 .88 .86	.90 .90 .90	.84 .84 .84	.91 .91 .91		.85 .85 .85	.84 .84 .84			.82 .82 .78	.88 .88 .88	.87 .87 .87		.82 .82 .81	.80 .80 .81		.82 .82 .82	.79 .79 .78	.79 .79 .79	.87 .85 .85	.85 .85 .81	.81 .81 .81	.81 .81 .81	.83 .83 .83	.81 .81 .81	.80 .80 .80		
	V	.96 .93 .93				.90 .90 .86		.91 .91 .91		.85 .85 .85				.82 .82 .82	.88 .88 .88	.87 .87 .87					.78 .78 .78			.85 .85 .81	.85 .85 .81		.81 .81 .81	.80 .80 .80	.81 .81 .81	.83 .83 .83	.80 .80 .80	
	VI	.96 .96 .95	.93 .93 .93	.86 .86 .85		.90 .90 .90		.91 .91 .91	.84 .85 .85	.85 .85 .85				.82 .82 .92	.88 .88 .92	.87 .87 .87				.82 .82 .79		.78 .78 .78	.82 .82 .82	.79 .79 .79	.85 .85 .85	.85 .85 .88	.81 .81 .81	.81 .81 .81	.83 .83 .83	.81 .81 .81	.80 .80 .80	
	VII	.95 .97 .98	.93 .93 .93	.85 .85 .85		.91 .91 .90	.89 .89 .89		.85 .85 .85	.85 .85 .85		.88 .88 .88	.86 .86 .86	.95 .95 .95	30. 7 30. 30.	.87 .87 .87	.80 .80 .80	.80 .80 .80	.90 .90 .90	.80 .80 .80	.78 .78 .78	.82 .82 .82	.80 .80 .80	.85 .85 .85	.90 .90 .90	.81 .81 .81	.83 .83 .83	.86 .86 .86	.83 .83 .83	.85 .85 .85		
	VIII	.98 .99 .99	.94 .94 .94	.90 .90 .90		.95 .95 .97	30. 30. 30.	.93 .93 .93	.87 .88 .88	.86 .88 .88	.85 .85 .87		.90 .82 .79	.96 .95 .95	30. 7 30. 30.	.87 .87 .85	.86 .86 .90	.80 .80 .90	.91 .91 .91	.80 .80 .87	.78 .78 .78	.84 .84 .84	.85 .85 .85	.94 .94 .94	.97 .97 .97	.83 .83 .83	.83 .83 .83	.86 .86 .86	.88 .88 .88	.83 .83 .83	.85 .85 .85	
	IX	.99 .99 .99	.95 .95 .95	.90 .90 .90		.97 .97 .97	30. 2 30. 2 30. 2	.97 .97 .97		.88 .88 .88		.82 .79 .79	.91 .88 .93	.93 .93 .93	29.99 29.99 29.99	.96 .96 .94	.85 .85 .85		.94 .94 .94	.85 .85 .85		.79 .79 .79	30. 30. 30.	.84 .84 .84		.79 .79 .79		.83 .83 .83	.86 .86 .86	.88 .88 .88	.83 .83 .83	.85 .85 .85
	X	.99 .99 .99		.89 .89 .89	.94 .94 .94	.97 .97 .97	30. 2 30. 2 30. 2			.88 .88 .88		.79 .79 .79	.88 .88 .88	.93 .93 .93	29.99 29.99 29.99	.96 .96 .94	.85 .85 .85		.94 .94 .94	.85 .85 .85		.78 .78 .78	.84 .84 .84	.79 .79 .79		.84 .84 .84		.83 .83 .83	.86 .86 .86	.88 .88 .88	.83 .83 .83	.85 .85 .85
	XI	.99 .99 .99				.97 .97 .97	30. 2 30. 2 30. 2	.97 .97 .97				.82 .82 .82	.91 .88 .93	.93 .93 .93	29.99 29.99 29.99	.96 .96 .94	.85 .85 .85		.94 .94 .94	.85 .85 .85		.78 .78 .78	.84 .84 .84	.79 .79 .79		.84 .84 .84		.83 .83 .83	.86 .86 .86	.88 .88 .88	.83 .83 .83	.85 .85 .85
	XII		.95 .95 .95				.97 .97 .97	30. 2 30. 2 30. 2	.97 .97 .97	.88 .88 .88	.88 .88 .88	.85 .85 .85	.79 .79 .79	.89 .89 .89	.93 .93 .93	.94 .94 .94	.85 .85 .85	.80 .80 .80	.94 .94 .94	.91 .91 .91	.81 .81 .81	.78 .78 .78	.84 .84 .84	.79 .79 .79	29.94 29.94 29.94	.84 .84 .84	.85 .85 .85	.82 .82 .82	.86 .86 .86		.83 .83 .83	.83 .83 .83

CALCUTTA. d. h. m. d. h. m.  
 New Moon, March 31 — 1 15 P. M. Last Quarter, April 23 — 6 42 P. M.  
 First Quarter, April 7 — 11 15 A. M. New Moon, April 19 — 9 53 P. M.  
 Full Moon, April 15 — 4 0 P. M. 1794.



a force just sufficient to prevent  $M$  from descending ; then the weight upon  $d$  in the first figure will be  $M+N-w$  ; in the second figure, the weight will be  $M-N+w$  ; and in the third figure,  $N-M-w$  ; and by proceeding as before, the values of  $w$  in the suspending forces are  $dn (M+N) : (n.Bd+dn) : dn (M-N) : (n.Bd-dn)$ , and  $dn (N-M) : (n.Bd+dn)$ , in the first, second and third figures respectively.

Because  $Bd : dA :: M : N$ , therefore if this value of  $N$  be substituted in each of the above expressions for the friction, the whole force capable of sustaining the friction and weight  $M$  will be had. Thus, for example, the moving force to overcome the friction and weight  $M$  in the first figure, will be  $M (n.dA+dn) : (n.Bd-dn)$ , and the suspending force  $M (n.dA-dn) : (n.Bd+dn)$  ; in the second figure the moving force will be  $M (n.dA+dn) : (n.Bd+dn)$ , and the suspending force  $M (n.dA-dn) : (n.Bd-dn)$  ; and in the third figure, the moving force will be  $M (n.dA-dn) : (n.Bd-dn)$ , and the suspending force will be  $M (n.dA+dn) : (n.Bd+dn)$ .

The method of finding  $n$  from each of the above equations is evident, and consequently the ratio of the friction to the pressure by experiments.

## OF FRICTION IN THE WEDGE.

Let  $AC^*$  be the force necessary to sustain the wedge  $QPB$  in the direction  $aB$  perpendicular to  $QP$ , friction included ; and let  $AB$  be the force exclusive of friction : draw  $AN$  and  $AH$  perpendicular to the  $BQ$  and  $BP$  ;  $CG$  parallel to  $AN$ , and  $CF$  parallel to  $AH$  : Now  $GA$  and  $AF$ , the forces of the wood against the sides of the wedge,

\* Fig. 15.



wedge, in those directions, compound a force equivalent to the diagonal CA in the direction CA, and therefore a force represented by AC in that direction, must be applied to the head of the wedge at *a* to overcome these forces. Let *gr* be the *n* part of *Ag*, and let the lines *Ar* be drawn, and also *GK* and *FZ* perpendicular to *AG* and *AF*, meeting the lines *Ar* in *K* and *Z*; then will *GK* and *FZ* represent the friction against the sides *BP* and *BQ*, being each the *n* part of *AG* and *AF*, the pressure against each side respectively; wherefore if *Be* be taken in *PB*, and *Bn* in *BQ*, equal to *GK* and *FZ* respectively, the forces *Be* and *Bn* in those directions, must compound a force to which the force *BC* in the direction *BC* must be equivalent; and consequently if *Bm* be the force compounded of *Be* and *Bn*, and *Cm* be joined, *Cm* must be perpendicular to *mB*; since *Be* or *GK* is the force of friction arising from the pressure against *BP*, which tends to prevent the wedge from moving either in the direction *BP* or *PB*; and *Bn* or *FZ* has a similar effect with respect to the direction in the line *BQ*; and by hypothesis, *BC* is just sufficient to balance these forces. It is also evident from what was said concerning the inclined plane, that *Be* and *Bn* must be taken in the directions *PB* and *QB* for the moving force, but in the directions *BP* and *BQ* for the suspending force.

The method of calculation is evident; for as *aB*, *AG*, and *AF*, are perpendicular to *QP*, *BP*, and *BQ*, the triangles *QPB* and *CAG* are similar, and the parallelogram *Bnme* similar to *FAGC*; whence by supposing certain parts given, the rest may be found; &c.

Corollary. When the wedge is isosceles, the point *m* falls on *C*, and *Be* is equal to *Bn*, and therefore *Be* or *GK* is equal to  $(AB + BC)PB : (n.QP)$ ; but  $PB : Ba :: 2 Be : BC$ , and therefore  $BC = 2 Ba (AB + BC : (n.QP))$   
or

or equal to  $(2Ba.BA) : (n.QP - 2Ba)$ , and therefore  $AC = (n.QP.AB) : (n.QP - 2Ba)$ ; and by following the same method for the suspending force, we find  $BC = (2Ba.AB) : (n.QP + 2Ba)$ , and consequently  $AC$  is equal to  $(n.QP.AB) : (n.QP + 2Ba)$ .

### S C H O L I U M.

By proceeding in a similar method, the forces of the arch-stones of bridges may be determined; for let  $QbbP$  be a stone sustained by the parts of the arch pressing against  $Pb$  and  $Qb$ , and let  $A$  be its center of gravity, and  $AB$  perpendicular to the horizon; also let  $AB$  and  $AC$  be the same as before; then because the body is in equilibrio, the force in direction  $AC$  will be equivalent to the force in a contrary direction, arising from the pressures against the body in the directions  $GA$  and  $KA$ , together with the force of friction; and because the pressures are  $AG$  and  $AK$ , if  $Be$  (the  $n$  part of  $AG$ ) be drawn parallel to  $PB$ ; and  $Bn$  (the  $n$  part of  $AK$ ) be drawn parallel to  $QB$ ; and the parallelogram  $Bnme$  be compleated, and  $Cm$  joined;  $Bm$  will be the force arising from friction, and the angle  $BmC$  a right angle. The adjacent figure \* is for the moving force; but the method is similar for the suspensive force; and it is evident that the one construction is of use to determine the force which tends to break an arch by pressing it downwards, and the other the force that tends to break it upwards.

But as that excellent mathematician *P. Frisè*, in his *Instituzioni di Meccanica*, has objected to the division of the force  $AB$  into the forces  $AN$  and  $AH$ , and thence concluded *Belidor* and *Couplet* to have been mistaken on that account in their writing upon bridges; I shall, therefore,



therefore, prove that the common method is really a consequence of what that gentleman himself allows, and that his objections are not well founded. In the first place, he allows the force  $AB$  to be equivalent to the forces  $AV$  and  $AD$  or  $VB$ ; now (excluding friction) if that part of the arch which touches  $Pb$  was removed, it is evident  $QbbP$  would immediately begin to descend along  $Qb$  with a force represented by  $VB$  or  $AD$ ; but this descent is prevented by that part of the arch which touches  $Pb$ ; and therefore the force of that arch, in the direction  $HA$ , must be such as to be equivalent to  $DA$  in the direction  $DA$  or  $BV$ : but no force greater or less than  $HA$  will be equivalent to  $DA$  in the direction  $DA$ , and therefore  $HA$  is the real pressure or force against  $Pb$ . Again,  $HD$  is the pressure in a perpendicular direction to  $Qb$  arising from this force; and as  $AV$  is the pressure against  $Qb$  arising from the force  $AB$ , therefore  $AV$ , together with  $HD$ , is the whole pressure against  $Qb$  in the direction  $AV$ ; but because the body is in equilibrium, and consequently the action or force in the direction  $AV$  equal to the re-action in a contrary direction; therefore  $AV + HD$  or  $AN$  (because  $NV$  is equal to  $HD$  by the property of the parallelogram) represents the pressure against  $Qb$ , and  $AH$  the pressure against  $Pb$ ; which is contrary to what *P. Frisi* asserts, and agreeable to the usual method.

The same learned author has made another very material mistake, from a similar cause, at page 67 of the aforesaid Treatise, relative to the tension of ropes; which cannot be attributed to haste or inadvertency, as he expressly asserts the holders of the common opinion to be mistaken, in consequence of their using the theory of composition of forces without sufficient precaution: I shall, therefore, after giving his own words, take the liberty of shewing where I apprehend he is mistaken.

“ Parleremo più a lungo delle altre ricerche matematiche, alle quali ha dato occasione la controversia insorta intorno alla cupola di S. Pietro. Coll' occasione che si è discorso in Milano di munire la fabbrica del Duomo di un Conduttore elettrico, che dalla cima dell' aguglia si dirimasse, e scendesse per differenti parti del tempio, si è ancora parlato dell' azione, che i fili del Conduttore potrebbero esercitare contra l' aguglia, e si sono proposti varj Problemi intorno alle tensioni delle funi. Io qui aggiugnerò le soluzioni, che ho ritrovato, e incomincerò dalla prima risoluzione, delle forze tendenti, laquale siccome è interamente differente da quella, che hanno seguitato altri Autori, così non farà meraviglia che porti dei risultati interamente differenti da quelli che sono stati finora publicati. Penda il \* filo,  $QVR$ , dai punti  $Q$ , ed  $R$ , e vi si attacchi in  $V$  il peso  $P$ . si produca la verticale  $PV$  in  $A$ ; si esprima il peso  $P$  colla retta  $AV$ , e dal punto  $A$ ; si tirino sopra  $RV$ ,  $RV$  le perpendicolari  $AM$ ,  $AN$ . Sarà  $MV$  l'intera forza esercitata secondo  $QV$ , ed  $NV$  farà quella che si eserciterà secondo  $RV$ .

“ La stessa così si dedurrebbe risolvendo la forza  $AV$  nelle due  $Aq$ ,  $Ar$  parallele ai fili  $QV$ ,  $RV$ , e poi risolvendo di nuovo la forza  $Aq$  nelle due  $AN$ ,  $Nq$ , e similmente la  $Ar$  in due altre  $AM$ ,  $Mr$ . Mentre queste risoluzioni è manifesto che la forza totale esercitata nel tendere il filo  $QV$  dev'essere  $Aq - Mr = rV - Mr = MV$ , e la tensione del filo  $RV = Vq - Nq = NV$ .

“ S'ingannerebbe chi misurasse separamente la tensione del filo  $QV$  dalla forza  $Aq$ , ossia  $rV$ , e la tensione di  $RV$  da  $Ar$ , oppure da  $qV$ . Egli è vero, che le due tensioni equivalgono insieme, come alla sola forza  $AV$ , così ancora alle due  $Ar$ ,  $Aq$ , oppure alle quattro insieme  $AN$ ,  $Nq$ ,  $AM$ ,  $Mr$ . ma nel prendere le tensioni separate



rate bisogna in oltre avvertire, che quando l' angolo  $QVR$  non è retto, una porzione di  $Aq$  agisce secondo  $RV$ , ed una porzione di  $Ar$  secondo  $QV$ : e separando le azioni fara  $MV$ , la tensione del filo  $QV$ , ed  $NV$  quella di  $RV$ ."

In the first place, I shall demonstrate the truth of the established method from principles that FRISI has himself allowed; and, secondly, point out the absurdity of his conclusions.

1. Let  $Vn$  and  $Sr$  be parallel to  $AN$ ; then because  $NVn$  is a right angle, and the force  $VA$  may be resolved into  $VN$  and  $Vn$ , in those directions, therefore, if  $RV$  and  $VP$  were to remain in the same position, and the force which now keeps the body suspended by acting in the direction  $VQ$ , was to act in the direction  $VN$  with a force expressed by  $Vn$ , it is then granted that the equilibrium would still be maintained, and the tensions would be as  $Vn$  and  $VN$ ; and, therefore, as no force  $VS$  whatever, acting at  $V$  in the direction  $RV$ , can have any effect in the direction  $Vn$  perpendicular to  $RV$ , it necessarily follows, that the force in any other direction  $VQ$ , must be such as to be equivalent to  $Vn$  in the direction  $Vn$ ; but it is likewise granted, that no other force but  $Vr$  in the direction  $VQ$  can be equivalent to  $Vn$  in the direction  $Vn$ ; and as the force  $Vr$  is equivalent to  $Vn$  and  $VS$ , and as  $VS$ , or its equal,  $qN$ , only gives an additional tension to  $NV$ , the tension which the cord  $RV$  was supposed to have before, which whole tension is equal to the re-action of the tack  $R$ ; therefore  $qV$  is the tension of the cord  $RV$ , and  $Vr$  that of  $Qv$ .

2. Let the points  $Q$  and  $R$  coincide, and  $RV$ ,  $QV$ , and  $VP$ , will then be perpendicular to the horizon; and if  $VQ$  or  $VR$  be assumed to express the weight  $P$ ,  
then

then will the points A, R, Q, M, and N, coincide; and according to *Frisi's* principle, the tensions of RV, VQ, and VP, will be equal; but, from the well-known principle of the pulley, each cord VQ and VR bears but half the weight P, and therefore this absurdity follows, that a cord is as much stretched with half the weight as it would with the whole.

Again, if the points R, V, and Q, be supposed horizontal, it follows, from the common theory, that the tension of the rope RVQ would be infinite; but VN and VM vanish when RVQ is horizontal; and therefore, by *Frisi's* principle, the tension in that case would be nothing at all; but it is well known from the most common experiments to be very considerable, even when RQV is but nearly horizontal; and therefore the new theory of this great mathematician is indefensible.

Remark. All the foregoing, except the last Scholium, was written in 1775, before the Author had seen any thing to speak of on the subject. He had designed and executed great part of an extensive treatise on friction, according to different hypotheses; but as nobody would be at the risk of publishing it, and he could not afford it himself, the most of it was accidentally lost. What is here given is an extract only of some of the first part, where velocity was not taken into the account, and where there were no complicated algebraic or fluxional expressions, which would be difficult to print in this country.



TO THE HONOURABLE

SIR WILLIAM JONES,

*President of the Asiatick Society.*

SIR,

I HAVE the honour to obey the orders of the Honourable the Governor General and Council, in transmitting to you, for the information of the *Asiatick Society*, an Extract of a Letter addressed to the Governor General, on the 2d of last Month, by Lieutenant SAMUEL Turner, who was appointed on an Embassy to *Tibet*; and a Copy of an Account enclosed in it, of Mr. TURNER's Interview with TEESHOO LAMA, at the Monastery of *Terpaling*.

I have the honour to be, with great respect,

SIR,

Your most obedient and most humble Servant,

E. HAY, *Secretary.*

*Council Chamber,  
Political Department, April 13, 1784.*

EXTRACT of a LETTER from Mr. SAMUEL  
TURNER to the Honourable the GOVERNOR  
GENERAL, dated Patna, 2d March, 1784.

**D**URING my residence in *Tibet*, it was an object I had much at heart, to obtain an interview of the infant *Teeshoo Lama*; but the Emperor of *China's* general orders, restricting his guardians to keep him in the strictest privacy, and prohibiting indiscriminately, the admission of all persons to his presence, even his votaries, who should come from a distance, appeared to me an obstacle almost insurmountable; yet, however, the Rajah, mindful of the amity subsisting between the Governor and him, and unwilling, I believe, by any act, to hazard its interruption, at length consented to grant me that indulgence. As the meeting was attended with very singular and striking circumstances, I could not help noting them with most particular attention; and though the repetition of such facts, interwoven and blended as they are with superstition, may expose me to the imputation of extravagance and exaggeration, yet I should think myself reprehensible to suppress them; and while I divest myself of all prejudice, and assume the part of a faithful narrator, I hope, however tedious the detail I propose to enter into may be found, it will be received with candour, and merit the attention of those for whose perusal and information it is intended, were it only to mark a strong feature in the national character, of implicit homage to the great religious Sovereign, and to instance the very uncommon, I may say almost unheard-of, effects of early tuition.

I shall, perhaps, be still more justified in making this relation, by adverting to that very extraordinary assurance the Rajah of *Teeshoo Loomboo* made me but a few days before my departure from his court, which, without



out further introduction, I will beg leave literally to recite.

At an interview he allowed me, after having given me my audience of leave, he said, “ I had yesterday a  
“ vision of our tutelary deity, and to me it was a day  
“ replete with much interesting and important matter.  
“ This guardian power, who inspires us with his illu-  
“ minations on every momentous and great occasion,  
“ indulged me with a divination, from which I have  
“ collected that every thing will be well. Set your  
“ heart at rest; for though a separation is about to take  
“ place between us, yet our friendship will not cease to  
“ exist; but, through the favour of interposing Provi-  
“ dence, you may rest assured it will increase, and ter-  
“ minate eventually in that which will be for the best.”

I should have paid less regard to so strange an observation, but for this reason, that, however dissonant from other doctrines their positions may be found, yet I judge they are the best foundation to build our reliances upon; and superstition combining with inclination to implant such friendly sentiments in their minds, will ever constitute, the opinion having once obtained, the strongest barrier to their preservation. Opposed to the prejudices of a people, no plan can reasonably be expected to take place: agreeing with them, success must be the result.

*A true Extract,*

E. H A Y,

*Secretary to the Governor General and Council.*

## VII.

*COPY of an Account given by Mr. TURNER, of his Interview with TEESHOO LAMA at the Monastery of Terpaling, enclosed in Mr. TURNER'S Letter to the Honourable the GOVERNOR GENERAL, dated Patna, 2d March, 1784.*

ON the 3d of December, 1783, I arrived at *Terpaling*, situated on the summit of a high hill; and it was about noon when I entered the gates of the Monastery, which was not long since erected for the reception and education of *Teeshoo Lama*. He resides in a Palace in the center of the Monastery, which occupies about a mile of ground in circumference, and the whole is encompassed by a wall. The several buildings serve for the accommodation of three hundred *Gylongs*, appointed to perform religious service with *Teeshoo Lama*, until he shall be removed to the Monastery and Musnud of *Teeshoo Loomboo*. It is unusual to make visits either here or in *Bootan* on the day of arrival: we therefore rested this day, only receiving and sending messages of compliment.

On the 4th, in the morning, I was allowed to visit *Teeshoo Lama*, and found him placed in great form upon his Musnud. On the left side stood his father and mother, on the other the officer particularly appointed to wait upon his person. The Musnud is a fabric of silk cushions, piled one upon the other until the seat is elevated to the height of four feet from the floor; embroidered silk covered the top; and the sides were decorated with pieces of silk of various colours,

suspended



suspended from the upper edge, and hanging down. By the particular request of *Teeshoo Lama's* father, Mr. *Saunders* and myself wore the English dress.

I advanced; and, as is the custom, presented a white pelong handkerchief; and delivered also into the *Lama's* hands, the Governor's present of a string of pearls and coral, while the other things were set down before him. Having performed the ceremony of the exchange of handkerchiefs with his father and mother, we took our seats on the right of *Teeshoo Lama*.

A multitude of persons, all those ordered to escort me, were admitted to his presence, and allowed to make their prostrations. The infant *Lama* turned towards them, and received them all with a cheerful and significant look of complacency. His father then addressed me in the *Tibet* language, which was explained to me by the interpreter, that *Teeshoo Lama* had been used to remain at rest until this time of the day; but he had awoke very early this morning, and could not be prevailed on to remain longer in bed; for, added he, "the  
" *English* Gentlemen were arrived, and he could not  
" sleep." During the time we were in the room, I observed the *Lama's* eyes were scarce ever turned from us; and when our cups were empty of tea, he appeared uneasy, and throwing back his head, and contracting the skin of his brow, he kept making a noise, for he could not speak, until they were filled again. He took out of a golden cup, containing confections, some burnt sugar, and stretching out his arm, made a motion to his attendants to give them to me. He then sent some in like manner to Mr. *Saunders*, who was with me. I found myself, though visiting an infant, under the necessity of  
saying

saying something; for it was hinted to me, that, notwithstanding he is unable to reply, it is not to be inferred that he cannot understand. However, his incapacity of answering excused me many words; and I just briefly said, That the Governor-General, on receiving the news of his decease in *China*, was overwhelmed with grief and sorrow, and continued to lament his absence from the world, until the cloud that had overcast the happiness of this nation by his re-appearance was dispelled; and then, if possible, a greater degree of joy had taken place than he had experienced of grief on receiving the first mournful news. The Governor wished he might long continue to illumine the world with his presence; and was hopeful that the friendship which had formerly subsisted between them would not be diminished, but rather that it might become still greater than before; and that, by his continuing to shew kindness to my countrymen, there might be an extensive communication between his votaries and the dependants of the *British* nation. The little creature turned, looking stedfastly towards me with the appearance of much attention while I spoke, and nodded with repeated but slow movements of the head, as though he understood and approved every word, but could not utter a reply. The parents, who stood by all the time, eyed their son with a look of affection, and a smile expressive of heartfelt joy at the propriety of the young *Lama's* conduct. His whole regard was turned to us: he was silent and sedate, never once looking towards his parents, as if under their influence at the time; and with whatever pains his manners may have been formed so correct, yet I must own his behaviour on this occasion, appeared perfectly natural and spontaneous, and not directed by any action or sign of authority.

The scene in which I was here brought to take a part, was too new and extraordinary, however trivial, if not



absurd, as it may appear to some, not to claim from me great attention, and consequently minute remark.

*Teeshoo Lama* is at this time about 18 months of age. He did not speak a word, but made most expressive signs, and conducted himself with astonishing dignity and decorum. His complexion is of that hue which in *England* we should term rather brown, but not without colour. His features good, small black eyes, an animated expression of countenance; and altogether I thought him one of the handsomest children I had ever seen. I had but little conversation with the father. He told me he had directions to entertain me three days on account of *Teeshoo Lama*; and entreated me with so much earnestness to pass another on his own account, that I could not resist complying with his request. He then invited us for to-morrow to an entertainment he proposed to make at a small distance from the Monastery, which invitation having accepted, we took our leave, and retired.

In the course of the afternoon I was visited by two officers of the *Lama's* household, both of whom are immediately attendant on his person. They sat and conversed with me some time, enquired after Mr. *Bogle*, whom both of them had seen; and then remarking how extremely fortunate it was the young *Lama's* having regarded us with very particular notice, observed on the very strong partiality of the former *Teeshoo Lama* for the *English*, and that the present one often tried to utter the name of the *English*. I encouraged the thought, hopeful that they would teach the prejudice to strengthen with his encreasing age; and they assured me that should he, when he begins to speak, have forgot, they would early teach him to repeat the name of *Hastings*.



On the morning of the 6th, I again waited on *Teeshoo Lama*, to present some curiosities I had brought for him from *Bengal*. He was very much struck with a small clock, and had it held to him, watching for a long time the revolutions of the moment hand: he admired it, but with gravity, and without any childish emotion. There was nothing in the ceremony different from the first day's visit. The father and mother were present. I staid about half an hour, and retired, to return and take leave in the afternoon.

The votaries of *Teeshoo Lama* already begin to flock in numbers to pay their adorations to him. Few are yet admitted to his presence. Those who come, esteem it a happiness if he is but shewn to them from the window, and they are able to make their prostrations before he is removed. There came to-day a party of *Kilmaaks* (*Cumuc Tartars*) for purposes of devotion, and to make their offerings to the LAMA. When I returned from visiting him, I saw them standing at the entrance of the square in front of the palace, each with his cap off, his hands being placed together elevated, and held even with his face. They remained upwards of half an hour in this attitude, their eyes fixed upon the apartment of the LAMA, and anxiety very visibly depicted in their countenances. At length, I imagine, he appeared to them; for they began all together by lifting their hands, still closed, above their heads, then bringing them even with their faces, and after lowering them to their breasts, then separating them; to assist them in sinking and rising, they dropt upon their knees, and struck their heads against the ground. This with the same motions was repeated nine times. They afterwards advanced to deliver their presents, consisting of talents of gold and silver, with the products of their country, to the proper officer, who having received them, they retired apparently with much satisfaction.



Upon enquiry, I learnt that offerings made in this manner are by no means unfrequent, and, in reality, constitute one of the most copious sources from which the *Lamas* of *Tibet* derive their wealth.

No one thinks himself degraded by performing these humiliations. The persons I allude to, who came for this devout purpose, were attendant on a man of superior rank, that seemed to be more engrossed than the rest in the performance of the ceremony. He wore a rich satin garment, lined with fox skins; and a cap with a tassel of scarlet silk flowing from the center of the crown upon the sides all round, and edged with a broad band of *Siberian* fur.

According to appointment, I went in the afternoon to make my last visit to *Teeshoo Lama*. I received his dispatches for the Governor-General, and from his parents two pieces of satin for the Governor, with many compliments.

They presented me with a vest, lined with lambskins, making many assurances of a long remembrance, and observing that at this time *Teeshoo Lama* is an infant, and incapable of conversing, but they hoped to see me again when he shall have become of age. I replied, that, by favor of the *Lama*, I might again visit this country: I looked forward with anxiety to the time when he should mount the Musnud, and should then be extremely happy in the opportunity of paying my respects. After some expressions and protestations of mutual regard, my visit was concluded. I received  
the

the handkerchiefs, and took my leave; and am to pursue my journey toward *Bengal* to-morrow at the dawn of day.

(Signed) SAMUEL TURNER.

*A true Copy,*

E. HAY,

*Secretary to the Governor General and Council.*



TO SIR WILLIAM JONES, KNIGHT,

*President of the Asiatick Society.*

S I R,

THE Honorable the Governor-General having received and laid before the Board, a Letter addressed to him by Lieutenant SAMUEL TURNER, containing the Account of a Journey made to *Teeshoo Loomboe*, by a *Goffeyn* named POORUNGEER, and the Circumstances of his Reception by TEESHOO LAMA, and the Board deeming it worthy of the Attention of the *Asiatick Society*, I have the Honor, in Obedience to their Directions, to transmit to you a Copy of it.

I have the Honor to be,

S I R,

Your most obedient humble Servant,

E. HAY, *Secretary.*

*Fort William,*  
*Secret Department, Feb. 22. 1786.*

## VIII.

## An ACCOUNT of a JOURNEY to TIBET.

TO THE HONORABLE

JOHN MACPHERSON, ESQ.

GOVERNOR-GENERAL, &amp;c.

*Fort William.*

HONORABLE SIR,

HAVING, in obedience to the instructions with which you were pleased to honour me, examined *Poorungeer*, the *Goffeyn*, who has at different times been employed in deputations to the late *Teeshoo Lama*, formerly accompanied him to the court of *Pekin*, and who is lately again returned from *Tibet*, and having collected from him such an account of the journey he has just performed, and other information, as he could give me relative to the countries he had left, I beg leave to submit it to you in the following narrative.

In the beginning of last year, *Poorungeer*, having received dispatches from Mr. *Hastings*, a short time previous to his departure from *Bengal*, for *Teeshoo Lama*, and the Regent of *Teeshoo Loomboo*, immediately set about preparing for the distant journey he had engaged to undertake, which employed him until the beginning of



of the following month of March, when I beg leave to recal to your remembrance, I had the honor to present him to you for his dismissal. He then commenced his journey from *Calcutta*, and early in the month of April had passed, as he relates, the limits of the Company's Provinces, and entered the mountains that constitute the Kingdom of *Bootan*, where, in the prosecution of his journey, he received from the subjects of the *Daib Raja*, the most ample and voluntary assistance to the frontier of his territory; nor met with any impediment to oppose his progress until he came upon the borders of *Tibet*. Here he was compelled to halt for near a fortnight by a heavy fall of snow, that commenced upon his arrival, and continued incessantly for the space of six days, covering the face of the country to so great a depth, as totally to put a stop to all travelling, and render it impracticable for him to proceed until a thaw succeeded to open the communication. During the time of his confinement at *Phari*, he says, such was the severity of the cold, and the injurious effect so rapid a transition from a temperate climate had on the health of himself and his companions, that it left him little room to doubt, if an early change had not fortunately taken place, and permitted his advance, that they must all have fallen victims to the inclemency of the weather.

However, as early as it was possible for him to leave *Phari*, he proceeded by long stages on his journey, and, without encountering any further difficulty, on the 8th of May following, reached *Tee-shoo Loomboo*, the capital of *Tibet*. Immediately upon entering the Monastery, he went to the Durbar of the Regent *Punjur Intinnec Nemohein* to announce his arrival, and the purpose of his commission. Quarters were then allotted for his residence, and an hour fixed for him to wait upon *Tee-shoo Lama*; who, as he was informed the following morning, intended to leave the Palace to occupy one of

of his gardens, situated on the plain within sight of the Monastery, where it was visible a considerable encampment had been formed. The *Lama* quitted his apartment at the first dawn of day, and was lodged in the tents pitched for his accommodation before the sun had risen.

In the course of the morning, at the hour appointed for his admission, *Poorungeer* went down to the *Lama's* tents. He heard, on entering the gates of the enclosure, that the young *Lama* was taking his recreation in the garden, ranging about, which became with him a very favourite amusement. As it was at this time in *Tibet* the warmest part of the year, that he might enjoy the benefit of the air, his attendants had chosen a spot where the trees afforded a complete shade, to place an elevated seat of cushions for the young *Lama*, after his exercise, to rest upon. In this situation *Poorungeer* found him, when summoned to his presence, attended by the Regent, his parents, *Soopoon Choomboo*, the cup-bearer, and the principal officers of the court. After making three obeisances at as remote a distance as it was possible, *Poorungeer* approached, and presented to the *Lama*, according to the custom of *Tibet*, a piece of white pelong, and then delivered the letters and presents with which he had been charged. The packages were all immediately opened before the *Lama*, who had every article brought near to him, and viewed them separately one by one. The letter he took into his own hand, himself broke the seal, and taking from under the cover a string of pearls, which it enclosed, ran them over between his fingers, as they read their rosaries, and then with an arch air placed them by his side, nor would, while the narrator was in his presence, permit any one to take them up. *Poorungeer* says the young *Lama* regarded him with a very kind and significant look,



look, spoke to him in the *Tibet* language, and asked him if he had had a fatiguing journey. The interview lasted more than an hour, during all which time the *Lama* sat with the utmost composure, not once attempting to quit his seat, nor discovering the least forward uneasiness at his confinement. Tea was twice brought in, and the *Lama* drank a cup each time. When ordered to accept his dismissal, *Poorungeer* approached the *Lama*, and bowing before him, presented his head uncovered to receive his blessing, which the young *Lama* gave by stretching out his hand, and laying it upon his head. He then ordered him, as long as he resided at *Teeshoo Loomboo*, to come to him once every day.

The following morning *Poorungeer* waited upon the Regent at his apartments in the Palace, to whom, after observing the customary forms of introduction, he delivered his dispatches. After this he visited *Soopoon Choomboo*, the *Lama's* parents, and others, to whom he was before known, and says he experienced from all quarters the most cordial and kind reception; for they had been long used to consider him as an agent of the Government of *Bengal*. He found no change whatever to have ensued in the administration since his attendance upon me in *Tibet*. The country enjoyed perfect tranquillity; and the only event that had taken place of importance in their annals, was the inauguration of the infant *Lama*, which happened the preceding year; and as this constitutes a concern of the highest moment, whether considered in a political or religious point of view, being no less than the recognizance, in an infant form, of their regenerated immortal Sovereign and Ecclesiastical Supreme, I was induced to bestow more than common pains to trace the ceremonies that attended the celebration of such a great event, conceiving that the novelty of the subject might render the account curious, if even it should be found to contain no information



mation of real utility. I shall therefore, without further apology, subjoin the result of my enquiries, premising only, that my authority for the description is derived principally from *Poorungeer*, and confirmed, with some additional particulars, by the concurring reports of a Gosselyn who was at that time himself present on the spot.

The Emperor of *China* appears, on this occasion, to have assumed a very conspicuous part, in giving testimony of his respect and zeal for the great religious Father of his Faith. Early in the year 1784, he dispatched Ambassadors from the court of *Pekin* to *Teeshoo Loomboo*, to represent their Sovereign in supporting the dignity of the High Priest, and do honor to the occasion of the assumption of his office. *Dalai Lama*, and the Viceroy of *Lassa*, accompanied by all the court, one of the *Chinese* Generals stationed at *Lassa*, with a part of the troops under his command, two of the four magistrates of the city, the heads of every monastery throughout *Tibet*, and the Emperor's Ambassadors, appeared at *Teeshoo Loomboo* to celebrate this epocha in their theological institutions. The 28th day of the seventh moon, corresponding nearly, as their year commences with the vernal equinox, to the middle of October, 1784, was chosen as the most auspicious for the ceremony of inauguration; a few days previous to which the *Lama* was conducted from *Terpaling*, the Monastery in which he had passed his infancy, with every mark of pomp and homage that could be paid by an enthusiastic people. So great a concourse, as assembled either from curiosity or devotion, was never seen before; for not a person of any condition in *Tibet* was absent who could join the suite. The procession was hence necessarily constrained to move so slow, that though *Terpaling* is situated at the distance of twenty miles only from *Teeshoo Loomboo*, three days expired in the performance of this short march. The first halt was  
made



made at *Tfondue* ; the second at *Summaar* ; about six miles off whence the most splendid parade was reserved for the *Lama's* entry on the third day ; the account of which is given me by a person who was present in the procession. The road, he says, was previously prepared by being whitened with a wash, and having piles of stones heaped up, with small intervals between, on either side. The retinue passed between a double row of priests, who formed a street extending all the way from *Summaar* to the gates of the Palace. Some of the priests held lighted rods of a perfumed composition, that burn like decayed wood, and emit an aromatic smoke ; the rest were furnished with the different musical instruments they use at their devotions, such as the gong, the cymbal, hautboy, trumpets, drums, and sea-shells, which were all sounded in union with the hymn they chanted. The croud of spectators were kept without the street, and none admitted on the high road, but such as properly belonged to, or had a prescribed place in, the procession, which was arranged in the following order.

The van was led by three military commandants, or governors of districts, at the head of 6 or 7000 horsemen, armed with quivers, bows, and matchlocks. In their rear followed the Ambassador, with his suite, carrying his diploma, as is the custom of *China*, made up in the form of a large tube, and fastened on his back. Next the *Chinese* General advanced with the troops under his command, mounted and accoutred after their way with fire arms and sabres ; then came a very numerous group, bearing the various standards and insignia of state. Next to them moved a full band of wind and other sonorous instruments ; after which were led two horses, richly caparisoned, each carrying two large circular stoves, disposed like panniers across the horse's back, and filled with burning aromatic woods.

These

These were followed by a senior priest, called a *Lama*, who bore a box, containing books of their form of prayer, and some favourite idols. Next nine sumptuary horses were led, loaded with the *Lama's* apparel; after which came the priests immediately attached to the *Lama's* person for the performance of daily offices in the Temple, amounting to about 700; following them were two men, each carrying on his shoulder a large cylindrical gold insignium, embossed with emblematical figures, (a gift from the Emperor of *China*.) The *Duhunniers* and *Soopoons*, who were employed in communicating addresses, and distributing alms, immediately preceded the *Lama's* bier, which was covered with a gaudy canopy, and borne by eight of the sixteen *Chinese* appointed for this service. On one side of the bier attended the Regent, on the other the *Lama's* Father. It was followed by the heads of the different monasteries; and as the procession advanced, the priests who formed the street fell in in the rear, and brought up the suite, which moved at an extremely slow pace, and about noon was received within the confines of the Monastery, amidst an amazing display of colours, the acclamations of the croud, solemn music, and the chanting of their priests.

The *Lama* being safely lodged in the Palace, the Regent and *Soopoon Choomboo* went out, as is a customary compliment paid to visitors of high rank on their near approach, to meet and conduct *Dalai Lama* and the Viceroy of *Lassa*, who were on the way to *Teeshoo Loomboo*. Their retinues encountered the following morning at the foot of *Painom* Castle, and the next day together entered the Monastery of *Teeshoo Loomboo*, in which both *Dalai Lama* and the Viceroy were accommodated during their stay.

The



The following morning, which was the third after *Teeshoo Lama's* arrival, he was carried to the great Temple, and about noon seated upon the throne of his progenitors; at which time the Emperor's Ambassador delivered his diploma, and placed the presents with which he had been charged at the *Lama's* feet.

The three next ensuing days *Dalai Lama* met *Teeshoo Lama* in the Temple, where they were assisted by all the priests in the invocation and public worship of their Gods. The rites then performed completed, as I understand, the business of inauguration. During this interval, all who were at the capital were entertained at the public expence, and alms were distributed without reserve. In conformity likewise to previous notice, circulated every where for the same space of time, universal rejoicings prevailed throughout *Tibet*. Banners were unfurled on all their fortresses, the peasantry filled up the day with music and festivity, and the night was celebrated by general illuminations. A long period was afterwards employed in making presents and public entertainments to the newly inducted *Lama*, who, at the time of his accession to the Musnud, or (if I may use the term) Pontificate, of *Teeshoo Loomboo*, was not three years of age. The ceremony was begun by *Dalai Lama*, whose offerings are said to have amounted to a greater value, and his public entertainments to have been more splendid, than the rest. The second day was dedicated to the Viceroy of *Lassa*. The third to the *Chinese* General. Then followed the Cullöong or Magistrates of *Lassa*, and the rest of the principal persons who had accompanied *Dalai Lama*. After which the Regent of *Teeshoo Loomboo*, and all that were dependent on that government, were severally admitted, according to pre-eminence of rank, to pay their tributes of obeisance and respect. As soon as the acknowledgments of all those were received who were admissible

sible to the privilege, *Teeshoo Lama* made, in the same order, suitable returns to each, and the consummation lasted forty days.

Many importunities were used with *Dalai Lama* to prolong his stay at *Teeshoo Loomboo*, but he excused himself from incumbering the capital any longer with so numerous a concourse of people as attended on his movements, and deeming it expedient to make his absence as short as possible from the seat of his authority, at the expiration of forty days he withdrew with all his suite to *Lassa*, and the Emperor's Ambassador received his dismissal to return to *China*: and thus terminated this famous festival.

With respect to the lately established commercial intercourse, *Poorungeer* informs me, that though so early, he found himself not the first person who had arrived at *Teeshoo Loomboo* from *Bengal*. Many merchants had already brought their commodities to market, and others followed before he left it. He heard from no quarter any complaint of impediment or loss, and concludes, therefore, that all adventurers met the same easy access and ready aid, as he himself had every where experienced. The markets are well stocked with *English* and *Indian* articles, yet not in so great a degree as to lower the value of commodities below the prices of the two or three last preceding years. Bullion was somewhat reduced in worth in comparison with the year 1783. A pootree, or bulse of gold dust, the same quantity that then sold for twenty-one indermillees, was procurable of a purer quality for nineteen and twenty indermillees. A talent of silver, which was then 500, was 450 indermillees; so that the exchange was much in favor of the trader.

*Poorungeer,*



*Poorungeer*, during his residence at *Teeshoo Loomboo*, had very frequent interviews with the Regent and the Ministers, and assures me, he found the heartiest dispositions in them to encourage the commercial intercourse established under the auspices of the late Governor-General, whose departure, however, the Regent regretted, as the loss of the first friend and ally he became connected with, of, I believe it may be said, any foreign nation; in whom was acknowledged also the original means of opening the communication, and of commencing a correspondence, between the Governments of *Bengal* and *Tibet*; and although it may be observed that, in consequence of his having, from the beginning, been used exclusively to address himself to, and acknowledge alone the agents of, Mr. *Hastings*, his attachments to the *English* nation had grown not without a great degree of personality; yet, free from an unworthy capriciousness of temper, he descended not to take advantage of the opening offered by his friend's departure to close the new connection. For such was the respect he had learnt to entertain for our national integrity of character, that, under the apparent conviction our views tended to no scheme of ambition, but were confined merely to objects of utility and curiosity, *Poorungeer* assures me, he expressed an anxious desire for continuing with the succeeding Governor-General, the exercise of those offices of friendship so long supported by his predecessor; and in the hope that his would be met with equal wishes, determined to invite you to join him in preserving the same intercourse of commerce and correspondence, so essentially calculated for the benefit of both countries. In consequence of which, the *Lama* and the Regent addressed the letters *Poorungeer* had the honour to deliver to you; translations of which having, in obedience to your directions, been applied for to your *Persian* translator, I now subjoin them,

*Copy of a Letter from TEESHOO LAMA.*

“ God be praised that the situation of these countries  
 “ is in peace and happiness, and I am always praying  
 “ at the altar of the Almighty for your health and pre-  
 “ servation. This is not unknown : you are certainly  
 “ employed in protecting and assisting the whole world,  
 “ and you promote the good and happiness of mankind.  
 “ We have made no deviation from the union and una-  
 “ nimity which existed during the time of the first of  
 “ nobles, Mr. *Hastings*, and the deceased *Lama* ; and  
 “ may you also grant friendship to these countries, and  
 “ always make me happy with the news of your health,  
 “ which will be the cause of ease to my heart, and con-  
 “ firmation to my soul. At this time, as friendly offer-  
 “ ings of union and unanimity, I send one handker-  
 “ chief, one ketoo of silver, and one piece of cochin.  
 “ Let them be accepted.”

*From the RAJAH of Teeshoo Loomboo.*

“ God be praised that the situation of these countries  
 “ is in peace and happiness, and I am always praying  
 “ at the altar of the Almighty for your health and pre-  
 “ servation. This is not unknown : I am constantly  
 “ employed in promoting the advantage of the subjects  
 “ and the service of the newly-seated *Lama*, because  
 “ the newly-seated *Lama* is not distinct from the de-  
 “ ceased *Lama*, and the light of his countenance is  
 “ exalted. Grant your friendship to *Poorungeer Gof-*  
 “ feyn.

“ Maintain union, and unanimity, and affection, like  
 “ the first of nobles, and every day make me happy  
 “ with the news of your health and prosperity : and  
 “ bestow favors like the first of nobles, and make me  
 Vol. I. R “ happy



“ happy with letters, which are causes of consolation.  
 “ At this time, as friendly offerings of union, and  
 “ affection, and unanimity, I send one handkerchief,  
 “ three tolah of gold, and one piece of cochin. Let  
 “ them be accepted.”

*Poorungeer*, having received these dispatches in the beginning of October, after a residence of five months at *Teeshoo Loomboo*, took leave of the *Lama* and the Regent, and set out on his return by the same route he came to *Bengal*. The weather at this season of the year being most extremely favorable for travelling, he experienced no delay or interruption in the course of his journey through *Tibet* and *Bootan*, but arrived at *Rungpore* early in December, whence he proceeded as expeditiously as possible to the Presidency ; where, to his great mortification and concern, he finds, upon his arrival, his affairs involved in great distress ; the little territory his adopted Chela was left in charge of, having, during his absence, been violently invaded by *Raaj Chund*, a neighbouring Zemeendar, and to the amount of fifty begas forcibly taken out of his hands. Prevailed on by his earnest repeated solicitations, I am induced to say for him, that in your justice and favor are his only hopes of relief from his embarrassments ; and he humbly supplicates your protection in restoring and securing him in the possession of his invaded right. The liberty of this intercession, I am confident to think, would be forgiven, were it not in favor of one who has rendered to this Government various useful services ; but as, though of trivial importance, it affords an authentic instance of the encroaching disposition of inferior Zemeendars. Yet another circumstance it may not be improper to point out. The ground alluded to is a part of the land situated upon the western bank of the river opposite Calcutta, that was formerly granted under a Sunnud of this Government to *Teeshoo Lama*,  
 for

for the foundation of a temple of worship, and as a resort for such pilgrims of their nation as might occasionally make visits to the consecrated Ganges.

Having, in conformity to your desires, done my best endeavours literally to translate all the information *Poorungeer* could give me, I have now only to apologize for the prolixity of the account, which I have been induced to be particularly minute in, as I conceived every circumstance, however trivial, might be in some degree interesting, that tends to illustrate any trait in the national character of a people we are but recently become acquainted with, and with whom, in its extended views, it has been an object of this Government to obtain a closer alliance.

I will not now presume to intrude longer on your time, by adding any observations on conjectures deducible from the elevated importance your young ally seems rising to, in consequence of the signal respect paid him by the most exalted political characters known to his nation; but beg leave to repeat, that it is with infinite satisfaction I learn from the reports of *Poorungeer*, the flourishing state of the lately projected scheme of trade, to promote which, he assures me, not any thing had been wanting in facility of intercourse; that the adventurers who had invested their property, had experienced perfect security in conducting their commerce, carried their articles to an exceeding good market, and found the rate of exchange materially in their favor.

Those advantages authorize the inference, that it will no doubt encourage more extensive enterprize; and permit me to add, I derive a confidence from the success of this infant essay, that inspires me with the strongest



hopes, that the commiffion which your Honorable Board was pleased to commit to my charge, will eventually be productive of effential benefits to the political and commercial interefts of the Company.

I have the honor to be,

HONORABLE SIR,

With the greateft refpect,

Your moft obedient, faithful,

And moft humble Servant,

SAMUEL TURNER.

*Calcutta, February 8th, 1786.*

## IX.

## ON THE GODS

OF

## GREECE, ITALY, AND INDIA,

WRITTEN IN 1784.

*And since revised by the President.*

WE cannot justly conclude, by arguments preceding the proof of facts, that one idolatrous people must have borrowed their deities, rites, and tenets from another; since Gods of all shapes and dimensions may be framed by the boundless powers of imagination, or by the frauds and follies of men, in countries never connected; but when features of resemblance, too strong to have been accidental, are observable in different systems of polytheism, without fancy or prejudice to color them, and improve the likeness, we can scarce help believing, that some connection has immemorially subsisted between the several nations who have adopted them. It is my design, in this Essay, to point out such a resemblance between the popular worship of the old *Greeks* and *Italians* and that of the *Hindus*. Nor can there be room to doubt of a great similarity between their strange religions and that of *Egypt*, *China*, *Persia*, *Phrygia*, *Phœnicia*, *Syria*; to which, perhaps, we may safely add, some of the southern kingdoms, and even islands of *America*: while the *Gothic* system, which prevailed in the northern regions of *Europe*, was not merely similar to those of *Greece* and *Italy*, but almost the same, in another dress, with an embroidery of images apparently *Asiatick*. From all this, if it be satisfactorily proved, we may infer a general union or affinity between the most distinguished



distinguished inhabitants of the primitive world, at the time when they deviated, as they did too early deviate, from the rational adoration of the only true God.

There seem to have been four principal sources of all mythology. I. Historical or natural truth has been perverted into fable by ignorance, imagination, flattery, or stupidity; as a king of *Crete*, whose tomb had been discovered in that island, was conceived to have been the God of *Olympus*; and *Minos*, a legislator of that country, to have been his son, and to hold a supreme appellate jurisdiction over departed souls; hence too probably flowed the tale of *Cadmus*, as *Bochart* learnedly traces it; hence beacons or volcanos became one-eyed giants, and monsters vomiting flames; and two rocks, from their appearance to mariners in certain positions, were supposed to crush all vessels attempting to pass between them; of which idle fictions many other instances might be collected from the *Odysssey*, and the various *Argonautick* poems. The less we say of *Julian* stars, deifications of princes or warriors, altars raised, with those of *Apollo*, to the basest of men, and divine titles bestowed on such wretches as *Caius Octavianus*, the less we shall expose the infamy of grave senators and fine poets, or the brutal folly of the low multitude: but we may be assured, that the mad apotheosis of truly great men, or of little men falsely called great, has been the origin of gross idolatrous errors in every part of the Pagan world. II. The next source of them appears to have been a wild admiration of the heavenly bodies; and, after a time, the systems and calculations of astronomers; hence came a considerable portion of *Egyptian* and *Grecian* fable; the *Sabian* worship in *Arabia*; the *Persian* types and emblems of *Mihr*, or the Sun; and the far extended adoration of the elements and the powers of nature; and hence, perhaps, all the artificial Chronology of the *Chinese* and *Indians*, with the invention of demi-gods and heroes to fill the vacant niches in their extravagant and imaginary periods. III. Numberless



berless divinities have been created solely by the magick of poetry, whose essential business it is to personify the most abstract notions, and to place a Nymph or a Genius in every grove, and almost in every flower; hence *Hygieia* and *Jaso*, Health and Remedy, are the poetical daughters of *Æsculapius*, who was either a distinguished physician, or medical skill personified; and hence *Chloris*, or verdure, is married to the *Zephyr*. IV. The metaphors and allegories of moralists and metaphysicians, have been also very fertile in deities; of which a thousand examples might be adduced from *Plato*, *Cicero*, and the inventive commentators on *Homer*, in their pedigrees of the Gods, and their fabulous lessons of morality. The richest and noblest stream from this abundant fountain, is the charming philosophical tale of *Psyche*, or *the Progress of the Soul*; than which, to my taste, a more beautiful, sublime, and well-supported allegory was never produced by the wisdom and ingenuity of man. Hence also the Indian *Máyá*, or, as the word is explained by some *Hindoo* scholars, “the first Inclination of the Godhead to diversify himself” (such is their phrase) “by creating Worlds,” is feigned to be the Mother of universal Nature, and of all the inferior Gods; as a *Cashmirian* informed me, when I asked him, why *Cáma*, or *Love*, was represented as her Son: but the word *Máyá*, or *Delusion*, has a more subtle and recondite sense in the *Védánta* philosophy, where it signifies the system of *perceptions*, whether of secondary or primary qualities, which the Deity was believed by *Epicharmus*, *Plato*, and many truly pious men, to raise by his omnipresent spirit in the minds of his creatures; but which had not, in their opinion, any existence independent of mind.

In drawing a parallel between the Gods of the *Indian* and *European* Heathens, from whatever source they were derived, I shall remember, that nothing is less favorable to inquiries after truth than a systematical spirit, and shall call to mind the saying of a *Hindoo* writer, “that



“ that whoever obstinately adheres to any set of opi-  
 “ ons, may bring himself to believe that the freshest san-  
 “ dal-wood is a flame of fire.” This will effectually  
 prevent me from insisting, that such a God of *India* was  
 the *Jupiter* of *Greece*; such, the *Apollo*; such, the  
*Mercury*. In fact, since all the causes of polytheism  
 contributed largely to the assemblage of *Grecian* Divi-  
 nities, (though *Bacon* reduces them all to refined alle-  
 gories, and *Newton* to a poetical disguise of true history,)  
 we find many *Joves*, many *Apollos*, many *Mercuries*,  
 with distinct attributes and capacities: nor shall I pre-  
 sume to suggest more, than that, in one capacity or  
 another, there exists a striking similitude between the  
 chief objects of worship in ancient *Greece* or *Italy*,  
 and in the very interesting country which we now in-  
 habit.

The comparison, which I proceed to lay before you,  
 must needs be very superficial; partly from my short  
 residence in *Hindustan*, and partly from my want of  
 complete leisure for literary amusements; but princi-  
 pally because I have no *European* book to refresh my  
 memory of old fables, except the conceited, though not  
 unlearned, work of *Pomey*, entitled the *Pantheon*, and  
 that so miserably translated, that it can hardly be read  
 with patience. A thousand more strokes of resemblance  
 might, I am sure, be collected by any one who should  
 with that view peruse *Hesiod*, *Hyginus*, *Cornutus*, and  
 the other mythologists; or, which would be a shorter  
 and a pleasanter way, should be satisfied with the very  
 elegant *Syntagmata* of *Lilius Giraldus*.

Disquisitions concerning the manners and conduct of  
 our species in early times, or indeed at any time, are  
 always curious at least, and amusing; but they are highly  
 interesting to such as can say of themselves with *Chremes*  
 in the play, “ We are men, and take an interest in  
 “ all

“all that relates to mankind.” They may even be of solid importance in an age when some intelligent and virtuous persons are inclined to doubt the authenticity of the accounts delivered by *Moses* concerning the primitive world; since no modes or sources of reasoning can be unimportant, which have a tendency to remove such doubts. Either the first eleven chapters of *Genesis* (all due allowances being made for a figurative eastern style) are true, or the whole fabric of our national religion is false; a conclusion which none of us, I trust, would wish to be drawn. I, who cannot help believing the divinity of the *Messiah*, from the undisputed antiquity and manifest completion of many prophecies, especially those of *Isaiah*, in the only person recorded by history to whom they are applicable, am obliged, of course, to believe the sanctity of the venerable books to which that sacred person refers as genuine: but it is not the truth of our national religion, as such, that I have at heart; it is truth itself; and if any cool, unbiassed reasoner will clearly convince me, that *Moses* drew his narrative through *Egyptian* conduits from the primeval fountains of *Indian* literature, I shall esteem him as a friend for having weaned my mind from a capital error, and promise to stand among the foremost in assisting to circulate the truth which he has ascertained. After such a declaration, I cannot but persuade myself, that no candid man will be displeased, if, in the course of my work, I make as free with any arguments that he may have advanced, as I should really desire him to do with any of mine that he may be disposed to controvert. Having no system of my own to maintain, I shall not pursue a very regular method, but shall take all the Gods, of whom I discourse, as they happen to present themselves; beginning, however, like the *Romans* and the *Hindus*, with *Janus* or *Ganésa*.

The titles and attributes of this old *Italian* deity are fully comprised in two choriambick verses of *Sulpitius*;  
and



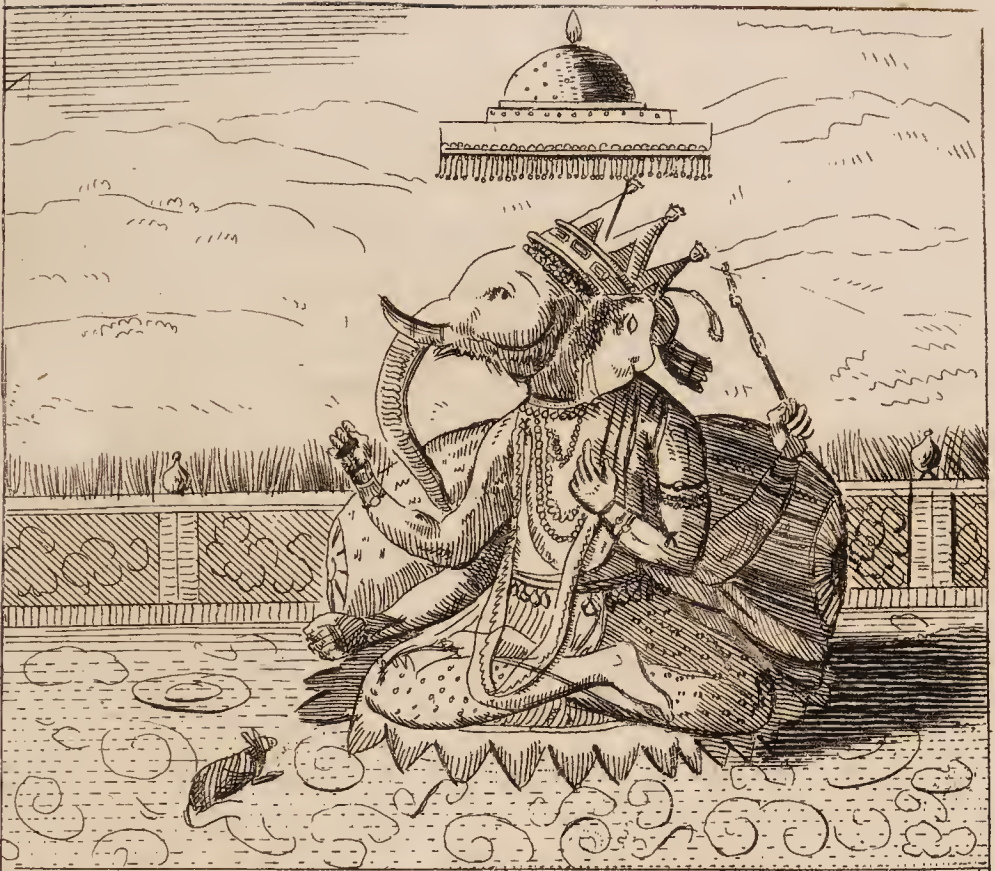
and a further account of him from *Ovid* would here be superfluous :

*Jane* pater, *Jane* tuens, dive biceps, biformis,  
O cate rerum fator, O principium deorum !

“ Father *Janus*, all-beholding *Janus*, thou divinity  
“ with two heads, and with two forms ; O sagacious  
“ planter of all things, and leader of deities !”

He was the God, we see, of *Wisdom* ; whence he is represented on coins with *two*, and, on the *Hetruscan* image found at *Falisci*, with *four*, faces ; emblems of prudence and circumspection : thus is *Ganéśa*, the God of *Wisdom* in *Hindustan*, painted with an *Elephant's* head, the symbol of sagacious discernment, and attended by a favourite *rat*, which the *Indians* consider as a wise and provident animal. His next great character (the plentiful source of many superstitious usages) was that from which he is emphatically styled *the father*, and which the second verse before cited more fully expresses, *the origin and founder of all things*. Whence this notion arose, unless from a tradition that he first built shrines, raised altars, and instituted sacrifices, it is not easy to conjecture ; hence it came, however, that his name was invoked before any other God ; that, in the old sacred rites, corn, and wine, and, in later times, incense also, were first offered to *Janus* ; that the *doors* or *entrances* to private houses were called *Januæ* ; and any pervious passage, or thoroughfare, in the plural number, *Jani*, or *with two beginnings* ; that he was represented holding a rod, as guardian of ways, and a key, as *opening* not gates only, but *all important works and affairs* of mankind ; that he was thought to preside over the morning, or *beginning of day* ; that, although the *Roman* year began regularly





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regularly with *March*, yet the eleventh month, named *Januarius*, was considered as *first* of the twelve, whence the whole year was supposed to be under his guidance, and opened with great solemnity by the consuls inaugurated in his fane, where his statue was decorated on that occasion with fresh laurel; and, for the same reason, a solemn denunciation of war, than which there can hardly be a more momentous national act, was made by the military consul's opening the gates of his temple with all the pomp of his magistracy. The twelve altars and twelve chapels of *Janus* might either denote, according to the general opinion, that he leads and governs twelve months, or that, as he says of himself in *Ovid*, all entrance and access must be made through him to the principal Gods, who were, to a proverb, of the same number. We may add, that *Janus* was imagined to preside over infants at their birth, on the *beginning* of life.

The *Indian* Divinity has precisely the same character: all sacrifices and religious ceremonies, all addresses even to superior Gods, all serious compositions in writing, and all worldly affairs of moment, are begun by pious *Hindus* with an invocation of *Ganésa*; a word composed of *ísa*, the *governor* or *leader*, and *gana*, or a *company* of deities, *nine* of which companies are enumerated in the *Amarcósh*. Instances of opening business auspiciously by an ejaculation to the *Janus* of *India* (if the lines of resemblance here traced will justify me in so calling him) might be multiplied with ease. Few books are begun without the words "*salutation to Ganés*;" and he is first invoked by the *Bráhmans*, who conduct the trial by ordeal, or perform the ceremony of the *hóma*, or sacrifice to fire. M. *Sonnerat* represents him as highly revered on the coast of *Coromandel*; "where the *Indians*," he says, "would not on any account build a house, without having placed on the ground an image of this  
" deity,



“ deity, which they sprinkle with oil, and adorn every  
 “ day with flowers: they set up his figure in all their  
 “ temples, in the streets, in the high roads, and in open  
 “ plains at the foot of some tree; so that persons of all  
 “ ranks may invoke him, before they undertake any  
 “ business; and travellers worship him, before they pro-  
 “ ceed on their journey.” To this I may add, from my  
 own observation, that in the commodious and useful  
 town which now rises at *Dharmāranya* or *Gayà*, under  
 the auspices of the active and benevolent *Thomas Law*,  
*Esq.* collector of *Rotas*, every new-built house, agree-  
 ably to an immemorial usage of the *Hindus*, has the  
 name of *Ganésa* supercribed on its door; and in the  
 old town, his image is placed over the gates of the  
 temples.

We come now to *Saturn*, the oldest of the Pagan  
 Gods, of whose office and actions much is recorded.  
 The jargon of his being the son of Earth and Heaven,  
 who was the son of the Sky and the Day, is purely a  
 confession of ignorance who were his parents, or who  
 his predecessors; and there appears more sense in the  
 tradition said to be mentioned by the inquisitive and  
 well-informed *Plato*, “ that both *Saturn*, or *Time*, and  
 “ his consort *Cybele*, or the *Earth*, together with their  
 “ attendants, were the children of *Ocean* and *Thetis*;  
 “ or, in less poetical language, sprang from the waters of  
 “ the great deep.” *Ceres*, the goddess of harvests, was,  
 it seems, their daughter; and *Virgil* describes “ the  
 “ mother and nurse of all as crowned with turrets, in  
 “ a car drawn by lions, and exulting in her hundred  
 “ grandsons, all divine, all inhabiting splendid celest-  
 “ tial mansions.” As the God of Time, or rather as  
*Time* itself personified, *Saturn* was usually painted by  
 the heathens holding a scythe in one hand, and, in the  
 other, a snake with its tail in its mouth, the symbol of  
 perpetual cycles and revolutions of ages: he was often  
 represented

represented in the act of devouring years, in the form of children; and sometimes encircled by the seasons, appearing like boys and girls. By the *Latins* he was named *Saturnus*: and the most ingenious etymology of that word is given by *Festus* the grammarian, who traces it, by a learned analogy to many similar names, *à fatu*, from planting; because, when he reigned in *Italy*, he introduced and improved agriculture: but his distinguishing character, which explains, indeed, all his other titles and functions, was expressed allegorically by the stern of a ship or galley on the reverse of his ancient coins; for which *Ovid* assigns a very unsatisfactory reason, “because the divine stranger arrived  
“in a ship on the *Italian* coast;” as if he could have been expected on horseback, or hovering through the air.

The account, quoted by *Pomey* from *Alexander Polyhistor*, casts a clearer light, if it really came from genuine antiquity, on the whole tale of *Saturn*; “that he  
“predicted an extraordinary fall of rain, and ordered  
“the construction of a vessel, in which it was necessary  
“to secure men, beasts, birds, and reptiles, from a general inundation.”

Now it seems not easy to take a cool review of all these testimonies concerning the birth, kindred, offspring, character, occupations, and entire life, of *Saturn*, without assenting to the opinion of *Bochart*, or admitting it at least to be highly probable, that the fable was raised on the true history of *Noah*; from whose flood a new period of *time* was computed, and a new series of ages may be said to have sprung; who rose fresh, and, as it were, newly born from the waves; whose wife was, in fact, the universal mother; and, that the earth might soon be repeopled, was early blessed with numerous and  
flourishing



flourishing descendants : if we produce, therefore, an *Indian* king of divine birth, eminent for his piety and beneficence, whose story seems evidently to be that of *Noah* disguised by *Asiatick* fiction, we may safely offer a conjecture, that he was also the same personage with *Saturn*. This was *Menu*, or *Satyaurata*, whose patronymick name was *Vaivaswata*, or Child of the *Sun* ; and whom the *Indians* not only believed to have reigned over the whole world in the earliest age of their chronology, but to have resided in the country of *Dravira*, on the coast of the Eastern *Indian* Peninsula : the following narrative of the principal event in his life I have literally translated from the *Bhágavat* ; and it is the subject of the first *Purána*, entitled that of the *Matsya*, or *Fish*.

“ Desiring the preservation of herds, and of *Bráhmans*,  
 “ of genii, and virtuous men, of the *Védas*, of law, and  
 “ of precious things, the Lord of the Universe assumes  
 “ many bodily shapes ; but though he pervades, like  
 “ the air, a variety of beings, yet he is himself unva-  
 “ ried, since he has no quality subject to change. At  
 “ the close of the last *Calpa*, there was a general de-  
 “ struction occasioned by the sleep of *Brahmá* ; whence  
 “ his creatures in different worlds were drowned in a  
 “ vast ocean. *Brahmá*, being inclined to slumber, de-  
 “ siring a repose after a lapse of ages, the strong demon  
 “ *Hayagríva* came near him, and stole the *Védas*, which  
 “ had flowed from his lips. When *Heri*, the Preserver  
 “ of the Universe, discovered this deed of the Prince of  
 “ *Dánavas*, he took the shape of a minute fish, called  
 “ *śap'harì*. A holy king, named *Satyaurata*, then  
 “ reigned ; a servant of the spirit, which moved on the  
 “ waves, and so devout, that water was his only suste-  
 “ nance. He was the child of the *Sun*, and, in the  
 “ present *Calpa*, is invested by *Naráyan* in the office of  
 “ *Menu*, by the name of *Sráddhadéva*, or the God of  
 “ Obsequies. One day, as he was making a libation to  
 “ the



“ the river *Critamálà*, and held water in the palm of his  
 “ hand, he perceived a small fish moving in it. The  
 “ king of *Dravira* immediately dropped the fish into  
 “ the river, together with the water which he had taken  
 “ from it; when the *sap’harì* thus pathetically addressed  
 “ the benevolent monarch: “ How canst thou, O king,  
 “ who showest affection to the oppressed, leave me in  
 “ this river-water, where I am too weak to resist the  
 “ monsters of the stream, who fill me with dread?”  
 “ He, not knowing who had assumed the form of a fish,  
 “ applied his mind to the preservation of the *sap’harì*,  
 “ both from good-nature, and from regard to his own  
 “ soul; and, having heard its very suppliant address,  
 “ he kindly placed it under his protection in a small vase  
 “ full of water; but, in a single night, its bulk was so  
 “ increased, that it could not be contained in the jar,  
 “ and thus again addressed the illustrious Prince: “ I  
 “ am not pleased with living miserably in this little vase,  
 “ make me a large mansion, where I may dwell in com-  
 “ fort.” The king, removing it thence, placed it in  
 “ the water of a cistern; but it grew three cubits in less  
 “ than fifty minutes, and said, “ O king, it pleases me  
 “ not to stay vainly in this narrow cistern: since thou  
 “ hast granted me an asylum, give me a spacious habi-  
 “ tation.” He then removed it, and placed it in a pool,  
 “ where, having ample space around its body, it became  
 “ a fish of considerable size. “ This abode, O king, is  
 “ not convenient for me, who must swim at large in the  
 “ waters: exert thyself for my safety; and remove me  
 “ to a deep lake.” Thus addressed, the pious monarch  
 “ threw the suppliant into a lake, and, when it grew of  
 “ equal bulk with that piece of water, he cast the vast  
 “ fish into the sea. When the fish was thrown into the  
 “ waves, he thus again spoke to *Satyaurata*: “ Here the  
 “ horned sharks, and other monsters of great strength,  
 “ will devour me; thou shouldest not, O valiant man,  
 “ leave me in this ocean.” Thus repeatedly deluded  
 “ by the fish, who had addressed him with gentle words,  
 “ the king said, “ Who art thou, that beguilest me in  
 “ that



“ that assumed shape ? Never before have I seen or heard  
 “ of so prodigious an inhabitant of the waters, who,  
 “ like thee, hast filled up, in a single day, a lake an  
 “ hundred leagues in circumference. Surely, thou art  
 “ *Bhágavat*, who appearest before me; the great *Heri*,  
 “ whose dwelling was on the waves; and who now, in  
 “ compassion to thy servants, bearest the form of the  
 “ natives of the deep. Salutation and praise to thee, O  
 “ first male, the lord of creation, of preservation, of  
 “ destruction ! Thou art the highest object, O supreme  
 “ ruler, of us thy adorers, who piously seek thee. All  
 “ thy delusive descents in this world give existence to  
 “ various beings : yet I am anxious to know for what  
 “ cause that shape has been assumed by thee. Let me  
 “ not, O lotos-eyed, approach in vain the feet of a  
 “ deity, whose perfect benevolence has been extended  
 “ to all ; when thou hast shown us, to our amazement,  
 “ the appearance of other bodies, not in reality existing,  
 “ but successively exhibited.” The Lord of the Universe,  
 “ loving the pious man, who thus implored him, and  
 “ intending to preserve him from the sea of destruction,  
 “ caused by the depravity of the age, thus told him how  
 “ he was to act. “ In seven days from the present time,  
 “ O though tamer of enemies, the three worlds will be  
 “ plunged in an ocean of death ; but, in the midst of  
 “ the destroying waves, a large vessel, sent by me for  
 “ thy use, shall stand before thee. Then shalt thou take  
 “ all medicinal herbs, all the variety of seeds ; and,  
 “ accompanied by seven saints, encircled by pairs of all  
 “ brute animals, thou shalt enter the spacious ark, and  
 “ continue in it, secure from the flood, on one immense  
 “ ocean without light, except the radiance of thy holy  
 “ companions. When the ship shall be agitated by an  
 “ impetuous wind, thou shalt fasten it with a large sea-  
 “ serpent on my horn ; for I will be near thee, draw-  
 “ ing the vessel, with thee and thy attendants. I will  
 “ remain on the ocean, O chief of men, until a night  
 “ of *Brahmá* shall be completely ended. Thou shalt  
 “ then



“ then know my true greatness, rightly named the Su-  
 “ preme Godhead : by my favour, all thy questions shall  
 “ be answered, and thy mind abundantly instructed.”  
 “ *Heri*, having thus directed the monarch, disappeared ;  
 “ and *Satyavrata* humbly waited for the time which  
 “ the ruler of our senses had appointed. The pious  
 “ king, having scattered toward the east the pointed  
 “ blades of the grass *darbha*, and turning his face to-  
 “ ward the north, sat meditating on the feet of the  
 “ God who had borne the form of a fish. The sea,  
 “ overwhelming its shores, deluged the whole earth ;  
 “ and it was soon perceived to be augmented by showers  
 “ from immense clouds. He, still meditating on the  
 “ command of *Bhágavat*, saw the vessel advancing, and  
 “ entered it with the chiefs of *Bráhmans*, having carried  
 “ into it the medicinal creepers, and conformed to the  
 “ directions of *Heri*. The saints thus addressed him :  
 “ O king, meditate on *Césava* ; who will, surely, deli-  
 “ liver us from this danger, and grant us prosperity.”  
 “ The God, being invoked by the monarch, appeared  
 “ again distinctly on the vast ocean in the form of a fish,  
 “ blazing like gold, extending a million of leagues, with  
 “ one stupendous horn ; on which the king, as he had  
 “ before been commanded by *Heri*, tied the ship with a  
 “ cable made of a vast serpent, and, happy in his prefer-  
 “ vation, stood praising the destroyer of *Madhu*. When  
 “ the monarch had finished his hymn, the primeval male,  
 “ *Bhágavat*, who watched for his safety on the greater ex-  
 “ panse of water, spoke aloud to his own divine essence,  
 “ pronouncing a sacred *Purána*, which contained the  
 “ rules of the *Sánc’hya* philosophy : but it was an infinite  
 “ mystery to be concealed within the breast of *Satya-*  
 “ *vrata* ; who, sitting in the vessel with the saints, heard  
 “ the principle of the soul, the External Being, pro-  
 “ claimed by the preserving power. Then *Heri*, rising  
 “ together with *Brahmá*, from the destructive deluge,  
 “ which was abated, slew the demon *Hayagríva*, and  
 “ recovered the sacred books. *Satyavrata*, instructed



“in all divine and human knowledge, was appointed  
 “in the present *Calpa*, by the favour of *Vishnu*, the  
 “seventh *Menu*, surnamed *Vaivaswata* : but the ap-  
 “pearance of a horned fish to the religious monarch  
 “was *Máyá*, or delusion ; and he who shall devoutly  
 “hear this important allegorical narrative, will be de-  
 “livered from the bondage of sin.”

This epitome of the first *Indian* history that is now extant, appears to me very curious and very important ; for the story, though whimsically dressed up in the form of an allegory, seems to prove a primeval tradition in this country of the *universal deluge* described by *Moses*, and fixes consequently the *time* when the genuine *Hindu* chronology actually begins. We find, it is true, in the *Purán*, from which the narrative is extracted, *another deluge*, which happened towards the close of the *third* age, when *Yudhist'hira* was labouring under the persecution of his inveterate foe *Duryódhan* ; and when *Christhna*, who had recently become incarnate for the purpose of succouring the pious, and destroying the wicked, was performing wonders in the country of *Mat'hurà* ; but the second flood was merely *local*, and intended only to affect the people of *Vraja* : they, it seems, had offended *Indrā*, the God of the firmament, by their enthusiastick adoration of the wonderful child, “ who  
 “ lifted up the mountain *Góverdhenā*, as if it had been  
 “ a flower ; and, by sheltering all the herdsmen and  
 “ shepherdesses from the storm, convinced *Indra* of  
 “ his supremacy.”

That the *Satya*, or (if we may venture so to call it) the *Saturnian* age was, in truth, the age of the *general* flood, will appear from a close examination of the ten *Avatárs*, or *descents* of the deity, in his capacity of preserver ; since of the four, which are declared to have happened in the *Satya* *yug*, the *three first* apparently relate to some stupendous convulsion of our globe from  
 the



the fountains of the deep; and the fourth exhibits the miraculous punishment of pride and impiety. First, as we have shown, there was, in the opinion of the *Hindus*, an interposition of Providence to preserve a devout person and his family (for all the *Pandits* agree, that his wife, though not named, must be understood to have been saved with him) from an inundation, by which all the wicked were destroyed: next, the power of the deity descends in the form of a *boar*, the symbol of strength, to draw up and support on his tusks the whole earth, which had been sunk beneath the ocean: thirdly, the same power is represented as a *tortoise* sustaining the globe, which had been convulsed by the violent assaults of demons; while the Gods churned the sea with the mountain *Mandar*, and forced it to disgorge the sacred things and animals, together with the water of life, which it had swallowed. These three stories relate, I think, to the same event, shadowed by a moral, a metaphysical, and an astronomical, allegory: and all three seem connected with the hieroglyphical sculptures of the old *Egyptians*. The fourth *Avatâr* was a *lion* issuing from a bursting column of marble to devour a blaspheming monarch, who would otherwise have slain his religious son; and of the remaining six, not one has the least relation to a deluge. The three which are ascribed to the *Trétâ yug*, when tyranny and irreligion are said to have been introduced, were ordained for the overthrow of tyrants, or their natural types, giants with a thousand arms, formed for the most extensive oppression: and, in the *Dwápar yug*, the incarnation of *Crishna* was partly for a similar purpose, and partly with a view to thin the world of unjust and impious men, who had multiplied in that age, and began to swarm on the approach of the *Cali yug*, or the age of contention and baseness. As to *Buddha*, he seems to have been a reformer of the doctrines contained in the *Védas*; and though his good-nature led him to censure those ancient books, because they enjoined sacrifices of



cattle, yet he is admitted as the ninth *Avatâr* even by the *Brâhmans* of *Câsi*, and his praises are sung by the poet *Jayadêva*: his character is in many respects very extraordinary; but, as an account of it belongs rather to history than to mythology, it is reserved for another dissertation. The tenth *Avatâr*, we are told, is yet to come, and is expected to appear mounted (like the crowned conqueror in the *Apocalypse*) on a white horse, with a cimeter blazing like a comet, to mow down all incorrigible and impenitent offenders who shall then be on earth.

These four *Yugs* have so apparent an affinity with the *Grecian* and *Roman* ages, that one origin may be naturally assigned to both systems. The first in both is distinguished as abounding in *gold*, though *Satya* means *truth* and *probity*, which were found, if ever, in the times immediately following so tremendous an exertion of the Divine Power as the destruction of mankind by a general deluge: the next is characterized by *silver*; and the third by *copper*: though their usual names allude to proportions imagined in each between vice and virtue. The present, or *earthen*, age seems more properly discriminated than by *iron*, is in ancient *Europe*; since that metal is not baser, or less useful, though more common, in our times, and consequently less precious, than copper; while mere *earth* conveys an idea of the lowest degradation. We may here observe, that the true History of the World seems obviously divisible into *four* ages or periods; which may be called, first, the *Diluvian*, or purest age; namely, the times preceding the deluge, and those succeeding it till the mad introduction of idolatry at *Babel*: next, the *Patriarchal*, or pure, age; in which, indeed, there were mighty hunters of beasts and of men, from the rise of patriarchs in the family of *Sem*, to the simultaneous,



ous establishment of great empires by the descendants of his brother *Hám* : thirdly, the *Mosaick*, or less pure, age ; from the legation of *Moses*, and during the time when his ordinances were comparatively well observed and uncorrupted : lastly, the *prophetical*, or *impure*, age, beginning with the vehement warnings given by the prophets to apostate kings and degenerate nations, but still subsisting, and to subsist, until all genuine prophecies shall be fully accomplished. The duration of the historical ages must needs be very unequal and disproportionate ; while that of the *Indian Yugs* is disposed so regularly and artificially, that it cannot be admitted as natural or probable. Men do not become reprobate in a geometrical progression, or at the termination of regular periods ; yet so well proportioned are the *Yugs*, that even the length of human life is diminished as they advance, from an hundred thousand years in a subdecuple ratio ; and, as the number of principal *Avatárs* in each decreases arithmetically from four, so the number of years in each decreases geometrically, and all together constitute the extravagant sum of four million three hundred and twenty thousand years, which aggregate, multiplied by seventy-one, is the period in which every *Menu* is believed to preside over the world. Such a period, one might conceive, would have satisfied *Archetas*, the measurer of sea and earth, and the numberer of their sands ; or *Archimedes*, who invented a notation that was capable of expressing the number of them ; but the comprehensive mind of an *Indian* chronologist has no limits ; and the reigns of fourteen *Menus* are only a single day of *Brahmá*, fifty of which days have elapsed, according to the *Hindus*, from the time of the creation. That all this puerility, as it seems at first view, may be only an astronomical riddle, and allude to the apparent revolution of the fixed stars, of which the *Bráhmans* made a mystery, I readily admit, and am even inclined to believe ; but so technical an arrangement excludes all idea of serious history. I am sensible how much these

remarks



remarks will offend the warm advocates for *Indian* antiquity ; but we must not sacrifice truth to a base fear of giving offence. That the *Védas* were actually written before the flood, I shall never believe ; nor can we infer, from the preceding story, that the learned *Hindus* believe it ; for the allegorical flumber of *Brahmá*, and the theft of the sacred books, mean only, in simpler language, that *the human race was become corrupt* ; but that the *Védas* are very ancient, and far older than other *Sanfcrít* compositions, I will venture to assert from my own examination of them, and a comparison of their style with that of the *Puráns* and the *Dherma Sástra*. A similar comparison justifies me in pronouncing, that the excellent law-book ascribed to *Swáyambhuva Menu*, though not even pretended to have been written by him, is more ancient than the *Bhágavat* ; but that it was composed in the first age of the world, the *Bráhmans* would find it hard to persuade me ; and the date which has been assigned to it, does not appear in either of the two copies which I possess, or in any other that has been collated for me : in fact, the supposed date is comprized in a verse, which flatly contradicts the work itself ; for it was not *Menu* who composed the system of law, by the command of his father *Brahmá*, but a holy personage, or demi-god, named *Bhrigu*, who revealed to men what *Menu* had delivered at the request of him, and other saints or patriarchs. In the *Mánava Sástra*, to conclude this digression, the measure is so uniform and melodious, and the style so perfectly *Sanfcrít*, or *polished*, that the book must be more modern than the scriptures of *Moses*, in which the simplicity, or rather nakedness, of the *Hebrew* dialect, metre, and style, must convince every unbiassed man of their superior antiquity.

I leave etymologists, who decide every thing, to decide whether the word *Menu*, or, in the nominative case,  
*Menus*,



*Menus*, has any connexion with *Minos* the lawgiver, and supposed son of *Jove*. The *Cretans*, according to *Diodorus* of *Sicily*, used to feign, that most of the great men, who had been deified in return for the benefits which they had conferred on mankind, were born in their island; and hence a doubt may be raised, whether *Minos* was really a *Cretan*. The *Indian* legislator was the first, not the seventh, *Menu*, or *Satyavrata*, whom I suppose to be the *Saturn* of *Italy*. Part of *Saturn's* character, indeed, was that of a lawgiver:

Qui genus indocile ac dispersum montibus altis  
Composuit legesque dedit:

And we may suspect that all the fourteen *Menus* are reducible to one, who was called *Nub* by the *Arabs*, and probably by the *Hebrews*; though we have disguised his name by an improper pronounciation of it. Some near relation between the seventh *Menu* and the Grecian *Minos*, may be inferred from the singular character of the *Hindu* god *Yama*, who was also a child of the *Sun*, and thence named *Vaivaswata*. He had too the same title with his brother, *Srâddhadêva*. Another of his titles was *Dhermarâja*, or *King of Justice*; and a third, *Pitri-peti*, or *Lord of the Patriarchs*; but he is chiefly distinguished as *judge of departed souls*; for the *Hindus* believe, that, when a soul leaves its body, it immediately repairs to *Yamapur*, or the city of *Yama*, where it receives a just sentence from him, and either ascends to *Swerga*, or the first heaven; or is driven down to *Narac*, the region of serpents; or assumes on earth the form of some animal, unless its offence had been such, that it ought to be condemned to a vegetable, or even to a mineral,



mineral, prison. Another of his names is very remarkable; I mean that of *Cála*, or *time*, the idea of which is intimately blended with the characters of *Saturn* and of *Noah*; for the name *Cronos* has a manifest affinity with the word *chronos*; and a learned follower of *Zerátusht* assures me, that, in the books which the *Behdins* hold sacred, mention is made of an *universal inundation*, there named the deluge of *Time*.

It having been occasionally observed, that *Ceres* was the poetical daughter of *Saturn*, we cannot close this head without adding, that the *Hindus* also have their *Goddeſs of Abundance*, whom they uſually call *Lacſhmí*, and whom they conſider as the daughter (not of *Menu*, but) of *Bhrigu*, by whom the firſt code of ſacred ordinances was promulgated. She is alſo named *Pedmá* and *Camalá*, from the ſacred lotos, or *Nymphaea*: but her moſt remarkable name is *Srí*, or, in the firſt caſe, *Srís*, which has a reſemblance to the *Latin*, and means *fortune* or *prosperity*. It may be contended, that although *Lacſhmí* may be figuratively called the *Ceres* of *Hinduſtan*, yet any two or more idolatrous nations, who ſubſiſted by agriculture, might naturally conceive a Deity to preſide over their labours, without having the leaſt intercourſe with each other; but no reaſon appears why two nations ſhould concur in ſuppoſing that Deity to be a female. One, at leaſt, of them would be more likely to imagine that the *Earth* was a goddeſs, and that the God of Abundance rendered her fertile. Beſides, in very ancient temples near *Gayá*, we ſee images of *Lacſhmí*, with full breaſt, and a *cord* twiſted under her arm like a *horn of plenty*, which look very much like the old *Grecian* and *Roman* figures of *Ceres*.

The fable of *Saturn* having been thus analyſed, let us proceed to his deſcendants; and begin, as the Poet ad-







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देवानामस्मिन्वाधवः

INDRA



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विने श्लोयक्षारक्षसाम्

CUVERA



advises, with *Jupiter*, whose supremacy, thunder, and libertinism, every boy learns from *Ovid*; while his great offices of Creator, Preserver, and Destroyer, are not generally considered in the systems of *European* mythology. The *Romans* had, as we have before observed, many *Jupiters*, one of whom was only the *Firmament* personified, as *Ennius* clearly expresses it :

Aspice hoc sublime candens, quem invocant omnes  
*Jovem.*

This *Jupiter* or *Diespiter* is the *Indian* God of the visible heavens, called *Indra*, or the *King*; and *Divespetir*, or *Lord of the Sky*; who has also the character of the Roman *Genius*, or chief of the Good Spirits; but most of his epithets in *Sanscrit* are the same with those of the *Ennian Jove*. His consort is named *Sachí*; his celestial city, *Amarávatí*; his palace, *Vaijayanta*; his garden, *Nandana*; his chief elephant, *Airávat*; his charioteer, *Mátali*; and his weapon, *Vajra*, or the thunderbolt: he is the regent of winds and showers; and though the East is peculiarly under his care, yet his *Olympus* is *Méru*, or the north pole, allegorically represented as a mountain of gold and gems. With all his power he is considered as a subordinate Deity, and far inferior to the *Indian Triad*, *Brahmá*, *Vishnu*, and *Mahádeva*, or *Siva*, who are three forms of one and the same Godhead: thus the principal divinity of the *Greeks* and *Latians*, whom they called *Zeus* and *Jupiter*, with irregular inflexions *Dios* and *Jovis*, was not merely *Fulminator*, the Thunderer, but, like the destroying power of *India*, *Magnus Divus*, *Ultor*, *Genitor*; like the preserving power, *Conservator*, *Soter*, *Opitulus*, *Altor*, *Ruminus*; and like the creating power, the *Giver of Life*; an attribute which I mention here

on



on the authority of *Cornutus*, a consummate master of mythological learning. We are advised by *Plato* himself, to search for the roots of *Greek* words in some barbarous, that is, foreign soil; but, since I look upon etymological conjectures as a weak basis for historical inquiries, I hardly dare suggest, that *Zev*, *Siv*, and *Jov*, are the same syllable differently pronounced. It must, however, be admitted, that the *Greeks* having no palatial *sigma*, like that of the *Indians*, might have expressed it by their *zéta*, and that the initial letters of *zugon* and *jugum* are (as the instance proves) easily interchangeable.

Let us now descend, from these general and introductory remarks, to some particular observations on the resemblance of *Zeus*, or *Jupiter*, to the triple divinity *Vishnu*, *Siva*, *Brahmá*; for that is the order in which they are expressed by the letters A, U, and M, which coalesce, and form the mystical word O'M; a word which never escapes the lips of a pious *Hindu*, who meditates on it in silence. Whether the *Egyptian* ON, which is commonly supposed to mean the Sun, be the *Sanscrit* monosyllable, I leave others to determine. It must always be remembered, that the learned *Indians*, as they are instructed by their own books, in truth, acknowledge only One Supreme Being, whom they call *Brahme*, or *the Great One*, in the neuter gender: they believe his essence to be infinitely removed from the comprehension of any mind but his own; and they suppose him to manifest his power by the operation of his divine spirit, whom they name *Vishnu*, the *Pervader*, and *Naráyan*, or *Moving on the Waters*, both in the masculine gender, whence he is often denominated the *First Male*; and by this power they believe that the whole order of nature is preserved and supported: but the *Védántis*, unable to form a distinct idea of brute matter independent of mind, or to conceive that the

work







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ब्रह्माहं विश्वनामृतः BRAHMA



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आदिशानामहविष्णुः VISHNU



work of Supreme Goodness was left a moment to itself, imagine that the Deity is ever present to his work, and constantly supports a series of perceptions, which, in one sense, they call *illusory*; though they cannot but admit the *reality* of all created forms, as far as the happiness of creatures can be affected by them. When they consider the Divine Power exerted in *creating*, or in giving existence to that which existed not before, they call the Deity *Brahmá* in the masculine gender also; and when they view him in the light of *Destroyer*, or rather *Changer* of forms, they give him a thousand names, of which *Siva*, *Isa*, or *Iswara*, *Rudra*, *Hara*, *Sambhu*, and *Mahádéva*, or *Mahésha*, are the most common. The first operations of these three *Powers* are variously described in the different *Puránas* by a number of allegories, and from them we may deduce the *Ionian* Philosophy of *primeval water*, the doctrine of the Mundane Egg, and the veneration paid to the *Nymphæ*, or *Lotos*, which was anciently revered in *Egypt*, as it is at present in *Hindustán*, *Tibet*, and *Népal*. The *Tibetians* are said to embellish their temples and altars with it: and a native of *Népal* made prostrations before it on entering my study, where the fine plant and beautiful flowers lay for examination. Mr. *Holwel*, in explaining his first plate, supposes *Brahmá* to be floating on a leaf of *betel* in the midst of the abyss; but it was manifestly intended by a bad painter for a lotos leaf, or for that of the *Indian* fig-tree; nor is the species of pepper, known in *Bengal* by the name of *Támbúla*, and on the Coast of *Malabar* by that of *betel*, held sacred, as he asserts, by the *Hindus*, or necessarily cultivated under the inspection of *Bráhmans*; though, as the vines are tender, all the plantations of them are carefully secured, and ought to be cultivated by a particular tribe of *Súdras*, who are thence called *Támbúlis*.

That *water* was the primitive element, and first work of the Creative Power, is the uniform opinion of the  
*Indian*



*Indian* philosophers ; but, as they give so particular an account of the general deluge, and of the creation, it can never be admitted that their whole system arose from traditions concerning the flood only, and must appear indubitable, that their doctrine is in part borrowed from the opening of *Birásit*, or *Genesis*, than which a sublimer passage, from the first word to the last, never flowed, or will flow, from any human pen : “ *In the beginning* God created the heavens and the earth. — And the earth was void and waste, and darkness was on the face of the deep, and the Spirit of God moved upon the face of the waters : and God said, *Let light be—and Light was.*” The sublimity of this passage is considerably diminished by the *Indian* paraphrase of it, with which *Menu*, the son of *Brahmá*, begins his address to the sages, who consulted him on the formation of the universe. “ This world (says he) was all darkness, undiscernible, undistinguishable, altogether as in profound sleep : till the self-existent invisible God, making it manifest with five elements, and other glorious forms, perfectly dispelled the gloom. He, desiring to raise up various creatures by an emanation from his own glory, first created the *waters*, and impressed them with a power of motion : by that power was produced a golden egg, blazing like a thousand suns, in which was born *Brahmá*, self-existing, the great parent of all rational beings. The waters are called *nára*, since they are the offspring of *Nera*, or *Isvara* ; and thence was *Naráyana* named, because his first *ayana*, or *moving*, was on them.

“ That which is, the invisible cause, eternal, self-existing, but unperceived, becoming masculine *from neuter*, is celebrated among all creatures by the name of *Brahmá*. That God, having dwelled in the Egg, through revolving years, Himself meditating on himself, divided it into two equal parts ; and from those  
“ halves

“ halves formed the heavens and the earth, placing in  
 “ the midst the subtil ether, the eight points of the  
 “ world, and the permanent receptacle of waters.”

To this curious description, with which the *Mánava Sástra* begins, I cannot refrain from subjoining the four verses, which are the text of the *Bhágavat*, and are believed to have been pronounced by the Supreme Being to *Brahmá*: the following version is most scrupulously literal.\*

“ Even I was even at first, not any other thing; that  
 “ which exists unperceived; supreme: afterwards *I am*  
 “ *that which is*: and he who must remain, am I.

“ Except the *First Cause*, whatever may appear, and  
 “ may not appear, in the mind, know that to be the  
 “ mind’s *Máyá*, or *Delusion*, as light, as darkness.

“ As the great elements are in various beings, enter-  
 “ ing, yet not entering, (that is, pervading, not destroy-  
 “ ing,) thus am I in them, yet not in them.

“ Even thus far may inquiry be made by him who  
 “ seeks to know the principle of mind, in union and  
 “ separation, which must be *every where always*.”

Wild

\* See the Original, p. 33. Plate IV.



Wild and obscure as these ancient verses must appear in a naked verbal translation, it will perhaps be thought by many, that the poetry or mythology of *Greece* and *Italy* afford no conceptions more awfully magnificent : yet the brevity and simplicity of the *Mosaick* diction are unequalled.

As to the creation of the world, in the opinion of the *Romans*, *Ovid*, who might naturally have been expected to describe it with learning and elegance, leaves us wholly in the dark, *which of the Gods was the actor in it*. Other mythologists are more explicit ; and we may rely on the authority of *Cornutus*, that the old *European* heathens considered *Jove* (not the son of *Saturn*, but of the *Ether*, that is, of an unknown parent) as the great *Life-giver*, and *Father of Gods and Men* : to which may be added the *Orphean* doctrine, preserved by *Proclus*, that “ the abyss and empyreum, the earth  
“ and sea, the Gods and Goddeses, were produced by  
“ *Zeus*, or *Jupiter*.” In this character he corresponds with *Brahmá* ; and, perhaps, with that God of the *Babylonians*, (if we can rely on the accounts of their ancient religion,) who, like *Brahmá*, reduced the universe to order, and, like *Brahmá*, *lost his head*, with the blood of which new animals were instantly formed. I allude to the common story, the meaning of which I cannot discover, that *Brahmá* had five heads, till one of them was cut off by *Naráyan*.

That, in another capacity, *Jove* was the *Helper* and *Supporter* of all, we may collect from his old *Latin* epithets, and from *Cicero*, who informs us, that his usual name is a contraction of *Juvans Pater* ; an etymology which shews the idea entertained of his character, though we may have some doubt of its accuracy. *Callimachus*, we know, addresses him as *the bestower of all good, and of security from grief* ; and, *since neither wealth without virtue, not virtue without wealth, give*  
1
complete



*complete happiness*, he prays, like a wise poet, for both. An *Indian* prayer for riches would be directed to *Lacshmi*, the wife of *Vishnu*, since the *Hindu* goddesses are believed to be the *powers* of their respective lords.

As to *Cuvéra*, the *Indian Plutus*, one of whose names in *Paulastya*, he is revered, indeed, as a magnificent Deity, residing in the palace of *Alacá*, or borne through the sky in a splendid car, named *Pushpaca*, but is manifestly subordinate, like the other seven *Genii*, to three principal Gods, or rather to the principal God considered in three capacities. As the soul of the world, or the pervading *mind*, so finely described by *Virgil*, we see *Jove* represented by several *Roman* poets; and with great sublimity by *Lucan* in the known speech of *Cato* concerning the *Ammonian* oracle: “*Jupiter* “is, wherever we look, wherever we move.” This is precisely the *Indian* idea of *Vishnu*, according to the four verses above exhibited: not that the *Bráhmans* imagine their male Divinity to be the *divine Essence* of the Great One, which they declare to be wholly incomprehensible; but, since the power of *preserving* created things by a superintending providence, belongs eminently to the Godhead, they hold that power to exist transcendently in the *preserving* member of the Triad, whom they suppose to be *every where always*; not in substance, but in spirit and energy: here, however, I speak of the *Vaishnavas*; for the *Saivas* ascribe a sort of pre-eminence to *Siva*, whose attributes are now to be concisely examined.

It was in the capacity of Avenger and Destroyer, that *Jove* encountered and overthrew the *Titans* and *Giants*, whom *Typhon*, *Briareus*, *Tityus*, and the rest of their fraternity, led against the God of *Olympus*; to whom an eagle brought *lightning* and *thunderbolts* during



during the warfare. Thus, in a similar contest between *Siva* and the *Daityas*, or children of *Diti*, who frequently rebelled against heaven, *Brahmá* is believed to have presented the God of Destruction with *fiery shafts*. One of the many poems, entitled *Rámáyan*, the last book of which has been translated into *Italian*, contains an extraordinary dialogue between the crow *Bhushunda*, and a rational eagle, named *Garúda*, who is often painted with the face of a beautiful youth, and the body of an imaginary bird; and one of the eighteen *Puránas* bears his name, and comprises his whole history. *M. Sonnerat* informs us, that *Vishnu* is represented in some places riding on the *Garúda*, which he supposes to be the *Pondicherie* eagle of *Briffon*, especially as the *Bráhmans* of the Coast highly venerate that bird, and provide food for numbers of them at stated hours. I rather conceive the *Garúda* to be a fabulous bird; but agree with him, that the *Hindu* God, who rides on it, resembles the ancient *Jupiter*. In the old temples at *Gayá*, *Vishnu* is either mounted on this poetical bird, or attended by it, together with a little page; but, lest an etymologist should find *Ganymed* in *Garud*, I must observe that the *Sanscrit* word is pronounced *Garura*; though I admit that the *Grecian* and *Indian* stories of the celestial bird and the page appear to have some resemblance. As the *Olympian Jupiter* fixed his court, and held his councils, on a lofty and brilliant mountain, so the appropriated seat of *Mahádéva*, whom the *Saivas* consider as the Chief of the Deities, was mount *Cailása*, every splinter of whose rocks was an inestimable gem. His terrestrial haunts are the snowy hills of *Himálaya*, or that branch of them to the East of the *Brahmaputra*, which has the name of *Chandrasic'hara*, or the *Mountain of the Moon*. When, after all these circumstances, we learn that *Siva* is believed to have *three eyes*, whence he is named also *Trilóchan*, and know from *Pausanias*, not only that *Triophthalmos* was an epithet of *Zeus*, but that a statue of him had been found so early as the

the taking of *Troy*, with a *third eye in his forehead*, as we see him represented by the *Hindus*, we must conclude, that the identity of the two Gods falls little short of being demonstrated.

In the character of *Destroyer* also, we may look upon this *Indian Deity* as corresponding with the *Stygian Jove*, or *Pluto*; especially since *Cáli*, or *Time*, in the feminine gender, is a name of his consort, who will appear hereafter to be *Proserpine*. Indeed, if we can rely on a *Persian* translation of the *Bhágavat*, (for the original is not yet in my possession,) the Sovereign of *Pátála*, or the *Infernal Regions*, is the *King of Serpents*, named *Séshanága*; for *Crishna* is there said to have descended with his favourite *Arjun* to the seat of that formidable divinity, from whom he instantly obtained the favour which he requested, that the souls of a *Bráhma*n's six sons, who had been slain in battle, might reanimate their respective bodies; and *Séshanága* is thus described. “ He had a  
 “ gorgeous appearance, with a thousand heads, and on  
 “ each of them a crown set with resplendent gems, one  
 “ of which was larger and brighter than the rest; his  
 “ eyes gleamed like flaming torches; but his neck, his  
 “ tongues, and his body, were black; the skirts of his  
 “ habiliment were yellow, and a sparkling jewel hung  
 “ in every one of his ears; his arms were extended, and  
 “ adorned with rich bracelets; and his hands bore the  
 “ holy shell, the radiated weapon, the mace for war,  
 “ and the lotos.” Thus *Pluto* was often exhibited in painting and sculpture, with a diadem and sceptre; but himself and his equipage were of the blackest shade.

There is yet another attribute of *Mahádéva*, by which he is too visibly distinguished in the drawings and  
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temples of *Bengal*. To destroy, according to the *Védánti's* of *India*, the *Súfi's* of *Persia*, and many philosophers of our *European* schools, is only to generate and reproduce in another form. Hence the God of *Destruction* is holden in this country to preside over *Generation*; as a symbol of which he rides on a *white bull*. Can we doubt that the loves and feats of *Jupiter Genitor*, (not forgetting the *white bull* of *Europa*,) and his extraordinary title of *Lapis*, for which no satisfactory reason is commonly given, have a connection with the *Indian* Philosophy and Mythology? As to the deity of *Lampsacus*, he was originally a mere scare-crow, and ought not to have a place in any mythological system; and, in regard to *Bacchus*, the God of *Vintage*, (between whose acts and those of *Jupiter*, we find, as *Bacon* observes, a wonderful affinity,) his *Ithyphallick* images, measures, and ceremonies, alluded probably to the supposed relation of Love and Wine; unless we believe them to have belonged originally to *Siva*; one of whose names is *Vágís*, or *Bágís*, and to have been afterwards improperly applied. Though, in an Essay on the Gods of *India*, where the *Bráhmíns* are positively forbidden to taste fermented liquors, we can have little to do with *Bacchus*, as God of Wine, who was probably no more than the imaginary President over the vintage in *Italy*, *Greece*, and the Lower *Asia*; yet we must not omit *Surádéví*, the Goddess of Wine, who arose, say the *Hindus*, from the ocean, when it was churned with the mountain *Mandar*: and this fable seems to indicate, that the *Indians* came from a country in which wine was anciently made, and considered as a blessing; though the dangerous effects of intemperance induced their early legislators to prohibit the use of all spirituous liquors; and it were much to be wished that, so wise a law had never been violated.

Here may be introduced the *Jupiter Marinus*, or *Neptune*, of the *Romans*, as resembling *Mahádéva* in his







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वरुणोपासामहम् VARUNA



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सैनाजीनामहं स्तुतः CARTICEYA



his *generative* character; especially as the *Hindu* God is the husband of *Bhaváni*, whose relation to the *waters* is evidently marked by her image being restored to them at the conclusion of her great festival called *Durgótsava*. She is known also to have attributes exactly similar to those of *Venus Marina*, whose birth from the sea-foam, and splendid rise from the conch, in which she had been cradled, have afforded so many charming subjects to ancient and modern artists; and it is very remarkable, that the *Rembhá* of *Indra's* court, who seems to correspond with the popular *Venus*, or Goddess of Beauty, was produced, according to the *Indian* fabulists, from the froth of the churned ocean. The identity of the *trisúla* and the *trident*, the weapon of *Siva* and of *Nep-tune*, seems to establish this analogy; and the veneration paid all over *India* to the large *buccinum*, especially when it can be found with the spiral line and mouth turned from left to right, brings instantly to our mind the musick of *Triton*. The Genius of Water is *Varuna*; but he, like the rest, is far inferior to *Mahéśa*, and even to *Indra*, who is the Prince of the beneficent Genii.

This way of considering the Gods as individual substances, but as distinct persons in distinct characters, is common to the *European* and *Indian* systems; as well as the custom of giving the highest of them the greatest number of names: hence, not to repeat what has been said of *Jupiter*, came the triple capacity of *Diana*; and hence her petition in *Callimachus*, that she might be *polyonymous*, or *many-titled*. The consort of *Siva* is more eminently marked by these distinctions than those of *Brahmá* or *Vishnu*: she resembles the *Isis Myrionymos*, to whom an ancient marble, described by *Gruter*, is dedicated; but her leading names and characters are *Párvatí*, *Durgá*, *Bhaváni*.



As the *Mountain-born* Goddess, or *Párvatí*, she has many properties of the Olympian *Juno*: her majestick deportment, high spirit, and general attributes, are the same; and we find her both on Mount *Cailása*, and at the banquets of the Deities, uniformly the companion of her husband. One circumstance in the parallel is extremely singular: she is usually attended by her son *Cárticéya*, who rides on a *peacock*; and in some drawings, his own robe seems to be spangled with eyes; to which must be added that, in some of her temples, a *peacock*, without a rider, stands near her image. Though *Cárticéya*, with his six faces and numerous eyes, bears some resemblance to *Argus*, whom *Juno* employed as her principal wardour, yet, as he is a Deity of the second class, and a Commander of celestial Armies, he seems clearly to be the *Orus* of *Egypt*, and the *Mars* of *Italy*: his name, *Scanda*, by which he is celebrated in one of the *Puránas*, has a connection, I am persuaded, with the old *Secander* of *Persia*, whom the poets ridiculously confound with the *Macedonian*.

The attributes of *Durgá*, or *difficult of access*, are also conspicuous in the festival above-mentioned, which is called by her name, and in this character she resembles *Minerva*; not the peaceful inventress of the fine and useful arts, but *Pallas*, armed with a helmet and spear: both represent heroick *Virtue*, or valour united with wisdom; both slew demons and giants with their own hands, and both protected the wise and virtuous, who paid them due adoration. As *Pallas*, they say, takes her name from *vibrating* a lance, and usually appears in complete armour, thus *Curis*, the old *Latain* word for a spear, was one of *Juno's* titles; and so, if *Giraldus* be correct, was *Hoplosmia*, which at *Elis*, it seems, meant a female dressed in panoply, or complete accoutrements. The *unarmed Minerva* of the Romans apparently corresponds,

sponds, as patroness of Science and Genius, with *Sereswatí*, the wife of *Brahmá*, and the emblem of his principal *Creative Power*. Both Goddesses have given their names to celebrated grammatical works; but the *Sáreswata* of *Sarúpáchárya* is far more concise, as well as more useful and agreeable, than the *Minerva* of *Sanctius*.

The *Minerva* of *Italy* invented the *flute*, and *Sereswatí* presides over melody: the protectress of *Athens* was even, on the same account, surnamed *Musicé*.

Many learned mythologists, with *Giraldus* at their head, consider the peaceful *Minerva* as the *Isis* of *Egypt*; from whose temple at *Sais* a wonderful inscription is quoted by *Plutarch*, which has a resemblance to the four *Sanscrit* verses above exhibited as the text of the *Bhágavat*: “ I am all that hath been, and is, and shall be; “ and my veil no mortal hath ever removed.” For my part, I have no doubt that the *Iswara* and *Isí* of the *Hindus*, are the *Osiris* and *Isis* of the *Egyptians*; though a distinct essay in the manner of *Plutarch* would be requisite in order to demonstrate their identity: they mean, I conceive, the *Powers of Nature* considered as Male and Female; and *Isis*, like the other goddesses, represents the active power of her lord, whose *eight* forms, under which he becomes visible to man, were thus enumerated by *Cálidása* near two thousand years ago. “ *Water* was the first work of the Creator; and *Fire* receives “ the oblation of clarified butter, as the law ordains: “ the *Sacrifice* is performed with solemnity: the *two* “ *Lights* of heaven distinguish time; the subtil *Ether*, “ which is the vehicle of sound, pervades the universe; “ the *Earth* is the natural parent of all increase; and by “ *Air* all things breathing are animated. May *Isa*, the “ power propitiously apparent in these eight forms, bless “ and sustain you!” The *five* elements, therefore, as  
well.



well as the Sun and Moon, are considered as *Isa*, or the *Ruler*, from which word *Isi* may be regularly formed; though *Isáni* be the usual name of his *active Power*, adored as the Goddess of Nature. I have not yet found in *Sanscrit*, the wild, though poetical, tale of *Io*; but am persuaded, that, by means of the *Purânas*, we shall in time discover all the learning of the *Egyptians*, without decyphering their hieroglyphicks. The bull of *Iswara* seems to be *Apis*, or *Ap*, as he is more correctly named in the true reading of a passage in *Jeremiah*; and if the veneration shown, both in *Tibet* and *India*, to so amiable and useful a quadruped as the Cow, together with the *regeneration* of the *Lama* himself, have not some affinity with the religion of *Egypt*, and the idolatry of *Israël*, we must at least allow that circumstances have wonderfully coincided.

*Bhavâni* now demands our attention; and in this character I suppose the wife of *Mahâdéva* to be as well the *Juno Cinxia*, or *Lucina*, of the Romans (called also by them *Diana Solvizona*, and by the Greeks, *Ilithyia*) as *Venus* herself: not the *Italian Queen of Laughter and Jollity*, who, with her Nymphs and Graces, was the beautiful child of poetical imagination, and answers to the Indian *Rembhâ*, with her celestial train of *Apśarâ's*, or damsels of paradise; but *Venus Urania*, so luxuriantly painted by *Lucretius*, and so properly invoked by him at the opening of a poem on nature: *Venus* presiding over *generation*, and, on that account, exhibited sometimes of both sexes, (an union very common in the *Indian* sculptures,) as in her *bearded* statue at *Rome*, in the images perhaps called *Hermathena*, and in those figures of her which had the form of a *conical marble*; “for the reason of which figure we are left (says *Tacitus*) “in the dark.” The reason appears too clearly in the temples and paintings of *Hindustan*; where it never seems to have entered the heads of the legislators or people,







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प्रजनशामिकंदर्पः CAMA.



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लोतसामसिनादवी ३१ GANGA.



people, that any thing natural could be offensively obscene ; a singularity which pervades all their writings and conversation, but is no proof of depravity in their morals.

Both *Plato* and *Cicero* speak of *Eros*, or the Heavenly *Cupid*, as the son of *Venus* and *Jupiter* ; which proves, that the Monarch of *Olympus*, and the Goddess of Fecundity, were connected, as *Mahádéva* and *Bhaváni*. The God *Cáma*, indeed, had *Máyá* and *Casyapa*, or *Uranus*, for his parents, at least according to the mythologists of *Cashmír* ; but, in most respects, he seems the twin-brother of *Cupid*, with richer and more lively appendages. One of his many epithets is *Dípaca*, the *Inflamer*, which is erroneously written *Dípuc* ; and I am now convinced, that the sort of resemblance which has been observed between his *Latin* and *Sanscrit* names is accidental : in each name the three first letters are the *root*, and between them there is no affinity. Whether any mythological connection subsisted between the *amaracus*, with the fragrant leaves of which *Hymen* bound his temples, and the *tulasí* of *India*, must be left undetermined : the botanical relation of the two plants (if *amaracus* be properly translated *marjorum*) is extremely near.

One of the most remarkable ceremonies in the festival of the *Indian* Goddess, is that before-mentioned, of casting her image *into the river*. The *Pandits*, of whom I inquired concerning its origin and import, answered, “ that it was prescribed by the *Véda*, they knew not “ why ;” but this custom has, I conceive, a relation to the doctrine, that *water* is a *form* of *Iswara*, and consequently of *Isáni*, who is even represented by some as the patroness of that element, to which her figure is restored after having received all due honours on *earth*, which is considered as another *form* of the God of Nature, though



though subsequent, in the order of Creation, to the primeval fluid. There seems no decisive proof of one original system among idolatrous nations in the worship of river-gods and river-goddeses, nor in the homage paid to their streams, and the ideas of purification annexed to them; since *Greeks, Italians, Egyptians, and Hindus*, might (without any communication with each other) have adored the several Divinities of their great rivers, from which they derived pleasure, health, and abundance. The notion of Doctor *Musgrave*, that large rivers were supposed, from their strength and rapidity, to be conducted by Gods, while rivulets only were protected by female Deities, is, like most other notions of grammarians on the genders of nouns, overthrown by facts. Most of the great *Indian* rivers are feminine; and the three goddeses of the waters, whom the *Hindus* chiefly venerate, are *Gangá*, who sprang, like armed *Pallas*, from the head of the *Indian Jove*; *Yamuná*, daughter of the Sun; and *Sereswati*. All three met at *Prayága*, thence called *Trivéni*, or *the three platted locks*; but *Sereswati*, according to the popular belief, sinks under ground, and rises at another *Trivéni* near *Húgli*, where she rejoins her beloved *Gangá*. The *Brahmaputra* is, indeed, a male river; and, as his name signifies the Son of *Brahmá*, I thence took occasion to feign that he was married to *Gangá*, though I have not yet seen any mention of him, as a God, in the *Sanscrit* books.

Two incarnate deities of the first rank, *Ráma* and *Crishna*, must now be introduced, and their several attributes distinctly explained. The first of them, I believe, was the *Dionysos* of the *Greeks*, whom they named *Bromius*, without knowing why; and *Bugenes*, when they represented him *horned*; as well as *Lyaïos* and *Eleutherios*, the Deliverer, and *Triambos*, or *Dithyrambos*, the Triumphant. Most of these titles were adopted by the *Romans*, by whom he was called *Bruma*, *Tauriformis*,

*formis, Liber, Triumphus*; and both nations had records or traditionary accounts of his *giving laws* to men, and deciding their contests; of his improving navigation and commerce; and, what may appear yet more observable, of his conquering *India*, and other countries, with an army of *Satyrs*, commanded by no less a personage than *Pan*; whom *Lilius Giraldus* (on what authority I know not) asserts to have resided in *Iberia*, “when he had returned (says the learned Mythologist) from the *Indian* war, in which he accompanied “*Bacchus*.” It were superfluous in a mere essay, to run any length in the parallel between this *European* God and the sovereign *Ayodhya*, whom the *Hindus* believe to have been an appearance on earth of the *Preserving Power*; to have been a conqueror of the highest renown, and the deliverer of nations from tyrants, as well as of his consort *Sitá* from the giant *Rávan*, king of *Lancá*; and to have commanded in chief a numerous and intrepid race of those large *Monkeys* which our naturalists, or some of them, have denominated *Indian Satyrs*. His General, the Prince of *Satyrs*, was named *Hanumat*, or *with high cheek-bones*; and, with workmen of such agility, he soon raised a bridge of rocks over the sea, part of which, say the *Hindus*, yet remains; and it is, probably, the series of rocks to which the *Muselmans*, or the *Portuguese*, have given the foolish name of *Adam’s* (it should be called *Ráma’s*) *Bridge*. Might not this army of *Satyrs* have been only a race of mountaineers, whom *Ráma* (if such a monarch ever existed) had civilized? However that may be, the large breed of *Indian Apes* is at this moment held in high veneration by the *Hindus*, and fed with devotion by the *Bráhmans*, who seem, in two or three places on the banks of the *Ganges*, to have a regular endowment for the support of them. They live in tribes of three or four hundred, are wonderfully gentle, (I speak as an eye-witness,) and appear to have some kind of order and subordination in their little sylvan polity. We must not



omit, that the father of *Hanumat* was the God of Wine, named *Pavan*, one of the eight Genii; and, as *Pan* improved the pipe by adding six reeds, and “played exquisitely on the cithern a few moments after his birth,” so one of the four systems of *Indian* musick bears the name of *Hanumat*, or *Hanumán* in the nominative, as its inventor, and is now in general estimation.

The war of *Lancá* is dramatically represented at the festival of *Ráma*, on the ninth day of the new moon of *Chaitra*; and the drama concludes (says *Holwel*, who had often seen it) with an exhibition of the fire-ordeal, by which the victor’s wife *Sítá* gave proof of her conjugal fidelity. “The dialogue (he adds) is taken from “one of the eighteen holy books,” meaning, I suppose, the *Puránas*; but the *Hindus* have a great number of regular dramas, at least two thousand years old, and among them are several very fine ones on the story of *Ráma*. The first poet of the *Hindus* was the great *Válmíc*, and his *Rámáyan* is an Epick Poem on the same subject, which, in unity of action, magnificence of imagery, and elegance of style, far surpasses the learned and elaborate work of *Nonnus*, entitled *Dionysíaca*, half of which, or twenty-four books, I perused with great eagerness when I was very young, and should have travelled to the conclusion of it, if other pursuits had not engaged me. I shall never have leisure to compare the *Dionysíacks* with the *Rámáyan*, but am confident, that an accurate comparison of the two poems would prove *Dionysos* and *Ráma* to have been the same person; and I incline to think that he was *Ráma*, the son of *Cúsh*, who might have established the first regular government in this part of *Asia*. I had almost forgotten, that *Meros* is said by the *Greeks* to have been a mountain of *India*, on which their *Dionysos* was born; and that *Méru*, though it generally means the north pole in the *Indian* geography, is also a mountain near the

the city of *Naiśhada*, or *Nyśa*, called by the *Grecian* geographers *Dionysopolis*, and universally celebrated in the *Sanscrit* poems; though the birth-place of *Rāma* is supposed to have been *Ayódhyá*, or *Audh*. That ancient city extended, if we believe the *Bráhmans*, over a line of ten *Yojans*, or about forty miles; and the present city of *Lac'hnaú*, pronounced *Lucnow*, was only a lodge for one of its gates, called *Lacshmanadwára*, or the gate of *Lacshman*, a brother of *Rāma*. M. *Sonnerat* supposes *Ayódhyá* to have been *Siam*; a most erroneous and unfounded supposition; which would have been of little consequence, if he had not grounded an argument on it, that *Rāma* was the same person with *Buddha*, who must have appeared many centuries after the conquest of *Lancá*.

The second great divinity, *Chriśhna*, passed a life, according to the *Indians*, of a most extraordinary and incomprehensible nature. He was the son of *Dévací* by *Vasudéva*; but his birth was concealed through fear of the tyrant *Canśa*, to whom it had been predicted, that a child born at that time, in that family, would destroy him: he was fostered, therefore, in *Mat'hurá* by an honest herdsman, surnamed *Ananda*, or *Happy*; and his amiable wife *Yasódá*, who, like another *Pales*, was constantly occupied in her pastures and her dairy. In their family were a multitude of young *Gópas*, or *Cowherds*, and beautiful *Gópis*, or *milkmaids*, who were his playfellows during his infancy; and, in his early youth, he selected *nine* damsels as his favourites, with whom he passed his gay hours in dancing, sporting, and playing on his flute. For the remarkable number of his *Gópis* I have no authority but a whimsical picture, where *nine* girls are grouped in the form of an elephant, on which he sits and pipes; and, unfortunately, the word *nava* signifies both *nine* and *new*, or young; so that, in the following stanza, it may admit of two interpretations:

tara-



*tarañijāpulinè navaballavī  
 perisadā saha célicutúhalāt  
 drutavilamwitachāruvihārinam  
 herimaham hrī dayéna sadā vahé.*

“ I bear in my bosom continually that God, who, for  
 “ sportive recreation with a train of *nine* (young) dairy-  
 “ maids, dances gracefully, now quick, now slow, on  
 “ the sands just left by the Daughter of the Sun.”

Both he and the three *Rāmas* are described as youths of perfect beauty ; but the princesses of *Hindustán*, as well as the damsels of *Nanda's* farm, were passionately in love with *Crishna*, who continues to this hour the darling God of the *Indian* women. The sect of *Hindus*, who adore him with enthusiastick, and almost exclusive, devotion, have broached a doctrine, which they maintain with eagerness, and which seems general in these provinces ; that he was distinct from all the *Avatárs*, who had only an *ansa*, or portion, of his divinity ; while *Crishna* was the *person* of *Vishnu* himself in a human form : hence they consider the third *Rāma*, his elder brother, as the eighth *Avatár*, invested with an *emanation* of his divine radiance ; and in the principal *Sanscrit* Dictionary, compiled about two thousand years ago, *Crishna*, *Vásadéva*, *Góvinda*, and other names of the Shepherd God, are intermixed with epithets of *Náráyan*, or the Divine Spirit. All the *Avatárs* are painted with gemmed *Ethiopian*, or *Parthian* coronets ; with rays encircling their heads ; jewels in their ears ; two necklaces, one straight, and one pendent on their bosoms, with dropping gems ; garlands of well-disposed many-coloured flowers, or collars of pearls, hanging down below their waists ; loose mantles of golden tissue or dyed silk, embroidered on their hems with flowers, elegantly thrown over one shoulder, and folded, like ribands,





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रामः स्वधृतामहम्

RAMA.



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दृष्टौ नावा लुदे गोस्मि

CRISHNA.





ribands, across the breast; with bracelets too on one arm, and on each wrist: they are naked to the waists, and uniformly with *dark azure* flesh, in allusion, probably, to the tint of that primordial fluid on which *Náráyan* moved in the beginning of time; but their skirts are bright yellow, the colour of the curious pericarpium in the center of the water-lily, where *Nature*, as Dr. Murray observes, *in some degree discloses her secrets*, each seed containing, before it germinates, a few perfect leaves: they are sometimes drawn with that flower in one hand; a radiated elliptical ring, used as a missile weapon, in a second; the sacred shell, or left-handed buccinum, in a third; and a mace, or battle-axe, in a fourth. But *Crishna*, when he appears, as he sometimes does appear, among the *Avatárs*, is more splendidly decorated than any, and wears a rich garland of sylvan flowers, whence he is named *Vanamáli*, as low as his ankles, which are adorned with strings of pearls. Dark blue, approaching to *black*, which is the meaning of the word *Crishna*, is believed to have been his complexion; and hence the large bee of that colour is consecrated to him, and is often drawn fluttering over his head. That azure tint, which approaches to blackness, is peculiar, as we have already remarked, to *Vishnu*: and hence in the great reservoir or cistern at *Cátmánda*, the capital of *Népal*, there is placed in a recumbent posture, a large well-proportioned image of *blue* marble, representing *Náráyan* floating on the waters. But let us return to the actions of *Crishna*, who was not less heroick than lovely, and, when a boy, slew the terrible serpent *Cáliya*, with a number of giants and monsters. At a more advanced age, he put to death his cruel enemy *Canfa*; and, having taken under his protection the king *Yudhisht'hir*, and the other *Pándus*, who had been grievously oppressed by the *Curus*, and their tyrannical chief, he kindled the war described in the great Epick Poem, entitled the *Mahābhārat*, at the prosperous conclusion of which he returned to his heavenly seat

in



in *Vaicont'ha*, having left the instructions comprised in the *Gítà* with his disconsolate friend *Arjun*, whose grandson became sovereign of *India*.

In this picture it is impossible not to discover, at the first glance, the features of *Apollo*, surnamed *Nomios*, or the *Pastoral*, in *Greece*, and *Opifer* in *Italy*; who fed the herds of *Admetus*, and slew the serpent *Python*; a God amorous, beautiful, and warlike. The word *Góvinda* may be literally translated *Nomois*, as *Césava* is *Crinitus*, or *with fine hair*; but whether *Gópála*, or the *herdsman*, has any relation to *Apollo*, let our Etymologists determine.

Colonel *Vallencey*, whose learned inquiries into the ancient literature of *Ireland* are highly interesting, assures me, that *Crishna* in *Irish* means the *Sun*; and we find *Apollo* and *Sol* considered by the *Roman* poets as the same deity. I am inclined, indeed, to believe, that not only *Crishna*, or *Vishnu*, but even *Brahmá* and *Siva*, when united, and expressed by the mystical word *O'M*, were designed by the first idolaters to represent the Solar Fire; but *Phæbus*, or the orb of the *Sun* personified, is adored by the *Indians* as the God *Súrya*, whence the sect who pay him particular adoration, are called *Sauras*. Their poets and painters describe his car as drawn by seven green horses, preceded by *Arun*, or the *Dawn*, who acts as his charioteer, and followed by thousands of *Genii*, worshipping him, and modulating his praises. He has a multitude of names, and among them twelve epithets or titles, which denote his distinct powers in each of the twelve months; those powers are called *Adityas*, or sons of *Aditi* by *Casyapa*, the *Indian Uranus*; and one of them has, according to some authorities, the name of *Vishnu*, or *Pervader*.

*Súrya*





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ज्याविनांरविरंशुमान् SURYA



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देववीणांनारदः। NAREDA.





*Sūrya* is believed to have descended frequently from his car in a human shape, and to have left a race on earth, who are equally renowned in the *Indian* stories with the *Heliadaï* of *Greece*. It is very singular, that his two sons, called *Aswinau*, or *Aswinícumárau*, in the dual, should be considered as twin-brothers, and painted like *Castor* and *Pollux*; but they have each the character of *Æsculapius* among the Gods, and are believed to have been born of a nymph, who, in the form of a mare, was impregnated with sun-beams. I suspect the whole fable of *Casyapa* and his progeny to be astronomical, and cannot but imagine, that the *Greek* name *Cassiopeia* has a relation to it.

Another great *Indian* family are called the *Children of the Moon*, or *Chandra*; who is a male Deity, and consequently not to be compared with *Artemis*, or *Diana*; nor have I yet found a parallel in *India* for the Goddess of the *Chase*, who seems to have been the daughter of an *European* fancy, and very naturally created by the invention of *Bucolick* and *Georgick* poets; yet since the *Moon* is a form of *Iswara*, the God of Nature, according to the verse of *Cálidása*, and since *Isáni* has been shown to be his consort, or power, we may consider her, in one of her characters, as *Luna*; especially as we shall soon be convinced that, in the shades below, she corresponds with the *Hecate* of *Europe*.

The worship of Solar or Vestal *Fire* may be ascribed, like that of *Osiris* and *Isis*, to the second source of Mythology, or an enthusiastick admiration of Nature's wonderful powers; and it seems, as far as I can yet understand the *Védas*, to be the principal worship recommended in them. We have seen, that *Mahádéva* himself is personated by *Fire*; but subordinate to him is the God *Agni*, often called *Pávaca*, or the *Purifier*, who  
answers



answers to the *Vulcan* of *Egypt*, where he was a Deity of high rank; and his wife *Swáhá* resembles the younger *Vesta*, or *Vestia*, as the *Eolians* pronounced the *Greek* word for a *hearth*. *Bhaváni*, or *Venus*, is the consort of the Supreme Destructive and Generative Power; but the *Greeks* and *Romans*, whose system is less regular than that of the *Indians*, married her to their *divine artist*, whom they also named *Hephaistos* and *Vulcan*, and who seems to be the *Indian Viswacarma*, the *forgers of arms* for the Gods, and inventor of the *agnyastra*, or *fiery shaft*, in the war between them and the *Daityas*, or *Titans*. It is not easy here to refrain from observing (and, if the observation gives offence in *England*, it is contrary to my intention) that the newly-discovered planet should unquestionably be named *Vulcan*; since the confusion of analogy in the names of the planets is inelegant, unscholarly, and unphilosophical. The name *Uranus* is appropriated to the firmament; but *Vulcan*, the slowest of the Gods, and, according to the *Egyptian* priests, the oldest of them, agrees admirably with an orb, which must perform its revolution in a very long period; and, by giving it this denomination, we shall have seven primary Planets with the names of as many *Roman* Deities, *Mercury*, *Venus*, *Tellus*, *Mars*, *Jupiter*, *Saturn*, *Vulcan*.

It has already been intimated, that the *Muses* and *Nymphs* are the *Gópya* of *Mat'hurà*, and of *Góverdhan*, the *Parnassus* of the *Hindus*, and the lyric poems of *Jayadéva* will fully justify this opinion; but the *Nymphs* of *Musick* are the *thirty Ráginís*, or *Female Passions*, whose various functions and properties are so richly delineated by the *Indian* painters, and so finely described by the poets: but I will not anticipate what will require a separate Essay, by enlarging here on the beautiful allegories of the *Hindus* in their system of musical modes, which they call *Rágás*, or *Passions*, and suppose to be *Genii*, or *Demigods*. A very distinguished son of  
*Brahmá,*

*Brahmá*, named *Náred*, whose actions are the subject of a *Purána*, bears a strong resemblance to *Hermes*, or *Mercury*: he was a wise legislator, great in arts and in arms, an eloquent messenger of the Gods, either to one another, or to favoured mortals, and a musician of exquisite skill. His invention of the *Víná*, or *Indian* lute, is thus described in the poem entitled *Mágha*: “*Náred* “sat watching from time to time his large *Víná*, which, “by the impulse of the breeze, yielded notes that “pierced successively the regions of his ear, and proceeded by musical intervals.” The law tract, supposed to have been revealed by *Náred*, is at this hour cited by the *Pandits*; and we cannot, therefore, believe him to have been the patron of *Thieves*; though an innocent theft of *Crishna*’s cattle, by way of putting his divinity to a proof, be strangely imputed, in the *Bhágavat*, to his father *Brahmá*.

The last of the *Greek* or *Italian* Divinities, for whom we find a parallel in the Pantheon of *India*, is the *Stygian* or *Taurick Diana*, otherwise named *Hecate*, and often confounded with *Proserpine*; and there can be no doubt of her identity with *Cáli*, or the wife of *Siva*, in his character of the *Stygian Fave*. To this black goddess, with a collar of golden skulls, as we see her exhibited in all her principal temples, *human sacrifices* were anciently offered, as the *Védas* enjoined; but, in the present age, they are absolutely prohibited, as are also the sacrifices of bulls and horses. Kids are still offered to her; and, to palliate the cruelty of the slaughter, which gave such offence to *Buddha*, the *Bráhmans* inculcate a belief, that the poor victims rise in the heaven of *Indra*, where they become the musicians of his band.

Instead of the obsolete, and now illegal, sacrifices of a man, a bull, and a horse, called *Neramédha*, *Gómédha*, and *Áswamédha*, the powers of nature are



thought to be propitiated by the less bloody ceremonies at the end of autumn, when the festivals of *Cáli* and *Lacshmi* are solemnized nearly at the same time. Now, if it be asked, how the Goddess of Death came to be united with the mild Patroness of Abundance, I must propose another question. How came *Proserpine* to be represented in the *European* system as the daughter of *Ceres*? Perhaps, both questions may be answered by the proposition of natural philosophers, that “the apparent destruction of a substance is the production of it in a different form.” The wild musick of *Cáli*’s priests at one of her festivals, brought instantly to my recollection the *Scythian* measures of *Diana*’s adorers in the splendid opera of *Iphigenia in Tauris*, which *Gluck* exhibited at *Paris* with less genius, indeed, than art, but with every advantage that an orchestra could supply.

That we may not dismiss this assemblage of *European* and *Asiatick* Divinities with a subject so horrid as the altars of *Hecate* and *Cáli*, let us conclude with two remarks, which properly, indeed, belong to the *Indian* Philosophy, with which we are not at present concerned. First; *Elysium* (not the place, but the bliss enjoyed there, in which sense *Milton* uses the word) cannot but appear, as described by the poets, a very tedious and insipid kind of enjoyment: It is, however, more exalted than the temporary *Elysium* in the court of *Indra*, where the pleasures, as in *Muhammed*’s paradise, are wholly sensual; but the *Mucti*, or *Elysian* happiness of the *Védánta* School, is far more sublime; for they represent it as a total absorption, though not such as to destroy consciousness in the Divine Essence; but, for the reason before suggested, I say no more of this idea of beatitude, and forbear touching on the doctrine of transmigration, and the similarity of the *Védánta* to the *Sicilian*, *Italick*, and old *Academick* Schools.

Secondly;

*Secondly* ; in the mystical and elevated character of *Pan*, as a personification of the *Universe*, according to the notion of Lord *Bacon*, there arises a sort of similitude between him and *Crishna*, considered as *Náráyan*. The *Grecian* God plays divinely on his reed, to express, we are told, ethereal harmony. He has his attendant Nymphs of the pastures and the dairy. His face is as radiant as the sky, and his head illumined with the horns of a crescent ; whilst his lower extremities are deformed and shaggy, as a symbol of the vegetables which the earth produces, and of the beasts who roam over the face of it. Now we may compare this portrait partly with the general character of *Crishna*, the Shepherd God, and partly with the description in the *Bhágavat*, of the Divine Spirit exhibited *in the form of this Universal World* ; to which we may add the following story from the same extraordinary poem. The Nymphs had complained to *Yasódá*, that the child *Crishna* had been drinking their curds and milk. On being reproved by his foster-mother for this indiscretion, he requested her to examine his mouth ; in which, to her just amazement, she beheld the *whole universe* in all its plenitude of magnificence.

We must not be surprised at finding, on a close examination, that the characters of all the *Pagan Deities*, male and female, melt into each other, and at last into one or two ; for it seems a well-founded opinion, that the whole crowd of gods and goddesses in ancient *Rome*, and modern *Várânes*, mean only the powers of Nature, and principally those of the *Sun*, expressed in a variety of ways, and by a multitude of fanciful names.

Thus have I attempted to trace, imperfectly at present, for want of ampler materials, but with a confidence



dence continually increasing as I advanced, a parallel between the Gods adored in three very different nations, *Greece, Italy, and India*; but which was the original system, and which the copy, I will not presume to decide; nor are we likely, I presume, to be soon furnished with sufficient grounds for a decision. The fundamental rule, that *natural, and most human, operations proceed from the simple to the compound*, will afford no assistance on this point; since neither the *Asiatick* nor *European* system has any simplicity in it; and both are so complex, not to say absurd, however intermixed with the beautiful and the sublime, that the honour, such as it is, of the invention, cannot be allotted to either with tolerable certainty.

Since *Egypt* appears to have been the grand source of knowledge for the *western*, and *India* for the more *eastern*, parts of the globe, it may seem a material question, whether the *Egyptians* communicated their Mythology and Philosophy to the *Hindus*, or conversely: but what the learned of *Memphis* wrote or said concerning *India*, no mortal knows; and what the learned of *Vârânes* have asserted, if any thing, concerning *Egypt*, can give us little satisfaction. Such circumstantial evidence on this question as I have been able to collect, shall nevertheless be stated; because, unsatisfactory as it is, there may be something in it not wholly unworthy of notice; though, after all, whatever colonies may have come from the *Nile* to the *Ganges*, we shall, perhaps, agree at last with Mr. Bryant, that *Egyptians, Indians, Greeks, and Italians*, proceeded originally from one central place, and that the same people carried their religion and sciences into *China* and *Japan*: may we not add, even to *Mexico* and *Peru*?

Every one knows that the true name of *Egypt* is *Miśr*, spelled with a palatial sibilant both in *Hebrew* and *Arabic*. It seems in *Hebrew* to have been the proper name of the first settler in it; and when the *Arabs* use the word for a great city, they probably mean a city like the capital of *Egypt*. Father *Marco*, a *Roman* missionary, who, though not a scholar of the first rate, is incapable, I am persuaded, of a deliberate falsehood, lent me the last book of a *Rāmāyan*, which he had translated through the *Hindi* into his native language, and with it a short vocabulary of mythological and historical names, which had been explained to him by the *Pandits* of *Betiyā*, where he had long resided. One of the articles in his little Dictionary was, “*Tirút*, a town or province, in which the priests from *Egypt* settled:” and when I asked him what name *Egypt* bore among the *Hindus*, he said *Miśr*; but observed, that they sometimes confounded it with *Abyssinia*. I perceived that his memory of what he had written was correct; for *Miśr* was another word in his index, “from which country (he said) came the *Egyptian* priests who settled in *Tirút*.” I suspected immediately that his intelligence flowed from the *Muselmans*, who call sugar-candy *Misrī*, or *Egyptian*; but, when I examined him closely, and earnestly desired him to recollect from whom he had received his information, he repeatedly and positively declared, that “it had been given him by several *Hindus*, and particularly by a *Bráhma*n, his intimate friend, who was reputed a considerable *Pandit*, and had lived three years near his house.” We then conceived that the seat of his *Egyptian* colony must have been *Tiróhit*, commonly pronounced *Tirút*, and anciently called *Mit’hilā*, the principal town of *Fanacadeśa*, or *North Bahār*; but *Ma-héśa Pandit*, who was born in that very district, and who submitted patiently to a long examination concerning *Miśr*, overset all our conclusions; he denied that the *Bráhma*ns of his country were generally surnamed *Miśr*, as we had been informed; and said, that the addition of *Misra* to the name of *Váchespeti*, and other learned authors,



thors, was a title formerly conferred on the writers of *miscellanies*, or *compilers* of various tracts of religion or science, the word being derived from a root signifying *to mix*. Being asked, where the country of *Misr* was, “There are two (he answered) of that name; one of them *in the west*, under the dominion of *Muselmáns*; and another, which all the *Sástras* and *Purānas* mention, in a mountainous region to the north of *Ayódhya*.” It is evident that by the first he meant *Egypt*; but what he meant by the second it is not easy to ascertain. A country, called *Tiruhut*, by our geographers, appears in the maps between the north-eastern frontier of *Audh* and the mountains of *Népal*; but whether that was the *Tirút* mentioned to Father *Marco* by his friend of *Betiya* I cannot decide. This only I know with certainty, that *Misra* is an epithet of two *Bráhmans* in the drama of *Sacotalá*, which was written near a century before the birth of *Christ*; that some of the greatest lawyers, and two of the finest dramatick poets, of *India* have the same title; that we hear it frequently in court added to the names of *Hindu* parties; and that none of the *Pandits*, whom I have since consulted, pretend to know the true meaning of the word, as a proper name, or to give any other explanation of it, than that it is a *surname* of *Bráhmans in the west*.

On the account given to Colonel *Kyd* by the old *Rájà* of *Crishnanagar*, “concerning traditions among the *Hindus*, that some *Egyptians* had settled in this country,” I cannot rely; because I am credibly informed by some of the *Rájà*’s own family, that he was not a man of solid learning, though he possessed curious books, and had been attentive to the conversation of learned men; besides, I know that his son, and most of his kinsmen, have been dabblers in *Persian* literature, and believe them very likely, by confounding one source of information with another, to puzzle themselves, and mislead those with whom they converse. The word



word *Misr*, spelled also in *Sanscrit* with a palatial sibilant, is very remarkable; and, as far as etymology can help us, we may safely derive *Nilus* from the *Sanscrit* word *níla*, or *blue*: since *Dionysius* expressly calls the waters of that river “an azure stream;” and, if we can depend on *Marco’s* Italian version of the *Rámáyán*, the name of *Níla* is given to a lofty and sacred mountain, with a summit of pure gold, from which flowed a river of clear, sweet, and fresh water.

M. Sonnerat refers to a dissertation by Mr. Schmit, which gained a prize at the Academy of Inscriptions, “On an *Egyptian* Colony established in *India*.” It would be worth while to examine his authorities, and either to overturn or verify them by such higher authorities as are now accessible in these provinces. I strongly incline to think him right, and to believe that *Egyptian* priests have actually come from the *Nile* to the *Gangá* and *Yamunà*, which the *Bráhmans* most assuredly would never have left. They might, indeed, have come either to be instructed, or to instruct; but it seems more probable that they visited the *Sarmans* of *India*, as the sages of *Greece* visited them, rather to acquire than to impart knowledge: nor is it likely that the self-sufficient *Bráhmans* would have received them as their preceptors.

Be all this as it may, I am persuaded that a connection subsisted between the old idolatrous nations of *Egypt*, *India*, *Greece*, and *Italy*, long before they emigrated to their several settlements, and consequently before the birth of *Moses*: but the proof of this proposition will in no degree affect the truth and sanctity of the *Mosaick* History, which, if confirmation were necessary, it would rather tend to confirm. The *Divine Legate*, educated by the daughter of a king, and in all respects highly accomplished, could not but know the mythological system of *Egypt*; but he must have condemned the superstitions of that people, and despised the speculative absurdities of their priests; though some  
of



of their traditions concerning the creation and the flood were grounded on truth.

Who was better acquainted with the mythology of *Athens* than *Socrates*? Who more accurately versed in the Rabbinical doctrines than *Paul*? Who possessed clearer ideas of all ancient astronomical systems than *Newton*? or of scholastical metaphysics than *Locke*? In whom could the *Roman Church* have had a more formidable opponent than in *Chillingworth*, whose deep knowledge of its tenets rendered him so competent to dispute them? In a word, who more exactly knew the abominable rites, and shocking idolatry, of *Canaan* than *Moses* himself? Yet the learning of those great men only incited them to seek other sources of truth, piety, and virtue, than those in which they had long been immersed. There is no shadow then of a foundation for an opinion, that *Moses* borrowed the first nine or ten chapters of *Genesis* from the literature of *Egypt*: still less can the adamantine pillars of our *Christian* faith be moved by the result of any debates on the comparative antiquity of the *Hindus* and *Egyptians*, or of any inquiries into the *Indian Theology*.

Very respectable natives have assured me, that one or two missionaries have been absurd enough, in their zeal for the conversion of the *Gentiles*, to urge, “that  
“the *Hindus* were even now almost *Christians*, because  
“their *Brahmá*, *Vishnu*, and *Mahésa*, were no other  
“than the *Christian Trinity*,” a sentence in which we can only doubt whether folly, ignorance, or impiety, predominates. The three powers, creative, preservative, and destructive, which the *Hindus* express by the trilateral word *O'm*, were grossly ascribed by the first idolaters, to the heat, light and flame of their mistaken divinity the Sun; and their wiser successors in the East, who perceived that the Sun was only a created thing, applied those powers to its Creator; but the *Indian Triad*, and that of *Plato*, which he calls the Supreme Good, the Reason, and the  
Soul,

Soul, are infinitely removed from the holiness and sublimity of the doctrine which pious *Christians* have deduced from texts in the Gospel; though other *Christians*, as pious, openly profess their dissent from them. Each sect must be justified by its own faith, and good intentions. This only I mean to inculcate, that the tenet of our Church cannot, without profaneness, be compared with that of the *Hindus*, which has only an apparent resemblance to it, but a very different meaning.

One singular fact, however, must not be suffered to pass unnoticed. That the name of *Crishna*, and the general outline of his story, were long anterior to the birth of our Saviour, and probably to the time of *Homer*; we know very certainly; yet the celebrated poem entitled *Bhāgavat*, which contains a prolix account of his life, is filled with narratives of a most extraordinary kind, but strangely variegated and intermixed with poetical decorations. The incarnate Deity of the *San scrit* romance was cradled, as it informs us, among *herdsmen*; but it adds, that he was educated among them, and passed his youth in playing with a party of milkmaids. A tyrant, at the time of his birth, ordered all new-born males to be slain; yet this wonderful babe was preserved by biting the breast, instead of sucking the poisoned nipple, of a nurse commissioned to kill him. He performed amazing, but ridiculous, miracles in his infancy, and, at the age of seven years, held up a mountain on the tip of his little finger. He saved multitudes, partly by his arms, and partly by his miraculous powers. He raised the dead, by descending for that purpose to the lowest regions. He was the meekest and best-tempered of beings, washed the feet of the *Brāhmans*, and preached very nobly, indeed, and sublimely, but always in their favor. He was pure and chaste in reality, but exhibited an appearance of excessive libertinism, and had wives or mistresses too numerous to be counted. Lastly, he was benevolent and tender, yet fomented and conducted



ducted a terrible war. This motley story must induce an opinion, that the spurious Gospels, which abounded in the first age of *Christianity*, had been brought to *India*, and the wildest parts of them repeated to the *Hindus*, who ingrafted them on the old fable of *Césava*, the *Apollo* of *Greece*.

As to the general extension of our pure faith in *Hindustán*, there are at present many sad obstacles to it. The *Muselmáns* are already a sort of heterodox *Christians*. They are *Christians*, if *Locke* reasons justly, because they firmly believe the immaculate conception, divine character, and miracles of the *Messiah*; but they are heterodox, in denying vehemently his character of Son, and his equality, as God, with the Father, of whose unity and attributes they entertain and express the most awful ideas; while they consider our doctrine as perfect blasphemy, and insist, that our copies of the Scriptures have been corrupted both by *Jews* and *Christians*. It will be inexpressibly difficult to undeceive them, and scarce possible to diminish their veneration for *Mohammed* and *Ali*, who were both very extraordinary men, and the second a man of unexceptionable morals. The *Korán* shines, indeed, with a borrowed light, since most of its beauties are taken from our Scriptures; but it has great beauties, and the *Muselmáns* will not be convinced that they were borrowed. The *Hindus*, on the other hand, would readily admit the truth of the Gospel; but they contend, that it is perfectly consistent with their *Sástras*. The Deity, they say, has appeared innumerable times, in many parts of this world, and of all worlds, for the salvation of his creatures; and though we adore him in one appearance, and they in others, yet we adore, they say, the same God, to whom our several worships, though different in form, are equally acceptable, if they be sincere in substance. We may assure ourselves, that neither *Muselmáns* nor *Hindus* will ever be converted by any mission from the Church of *Rome*, or from any other

other Church; and the only human mode, perhaps, of causing so great a revolution, will be to translate into *Sanfcrit* and *Persian*, fuch chapters of the Prophets, particularly of *Ifaiah*, as are indisputably Evangelical, together with one of the Gospels; and a plain prefatory difcourfe, containing full evidence of the very diftant ages, in which the predictions themfelves, and the hiftory of the Divine Perfon predicted, were feverally made publick; and then quietly to difperfe the work among the well-educated natives; with whom, if, in due time, it failed of producing very falutary fruit by its natural influence, we could only lament more than ever the ftrength of prejudice, and the weaknefs of unaffifted reafon.



X.

## A DESCRIPTION

OF A

## CAVE NEAR GYÁ.

BY JOHN HERBERT HARINGTON, Esq.

A KNOWLEDGE of the Antiquities of *Hindustan* forming one of the several objects proposed by the institution of our Society, with the hope of communicating something acceptable on this head, I took the opportunity of a late excursion up the country, to see the *Cave* which Mr. *Hodgekis* a few years since attempted to visit, at the desire, I believe, of the late Governor General, but was assassinated in his way to it by the followers of one of the rebellious allies of *Cheynt Sing*. On my describing it to the President, whom I had the pleasure to accompany, I was encouraged by him to think that a particular account of it would be curious and useful; and in consequence made a second visit to it from *Gyá*, when I took the following measurements, and, by the means of my *Moonshée*, a copy of the inscription on it, which I had despaired of presenting to you, but in its original language, (a *Pandit* at *Benáris* having attempted in vain to get it read during these last three months,) till the kind assistance of Mr. *Wilkins* enabled me to add the accompanying translation and remarks, to what would otherwise have given little satisfaction.

The hill, or rather rock, from which the cavern is dug, lies about fourteen miles north of the ancient city  
of

of *Gyá*, and seems to be one of the south-eastern hills of the chain of mountains called by *Rennel*, *Caramshah*, both being a short distance to the west of the *Phulgó*.

It is now distinguished by the name of *Nágurjinee*; but this may perhaps be a modern appellation, no mention of it being made in the inscription. Its texture is a kind of granite, called by the *Mohummedan* natives, *Sung Kháreh*, which composes the whole rock, of a moderate height, very craggy and uneven, and steep in its ascent.

The *cave* is situated on the southern declivity, about two thirds from the summit: a tree immediately before it prevents its being seen from the bottom. It has only one narrow entrance, from the south, two feet and a half in breadth, six feet high, and of thickness exactly equal. This leads to a room of an oval form, with a vaulted roof, which I measured twice, and found to be forty-four feet in length from east to west, eighteen feet and a half in breadth, and ten feet and a quarter in height at the centre. This immense cavity is dug entirely out of the solid rock, and is exceedingly well polished, but without any ornament. The same stone extends much farther than the excavated part, on each side of it, and is altogether, I imagine, full an hundred feet in length. The inhabitants near know nothing of its history, or age; but I learnt from a chief of the neighbouring village, that a tradition is extant, of a *Mohummedan*, named *Minháj-u-deen*, having performed his *cheeleh*, or forty days devotion, in this cavern; and that he was cotemporary with *Mukhdoom Sherf-u-deen*, a venerated *welee*, who died in *Behár* in the 590th year of the *Hijree*; and he even went so far as to aver, that he himself was descended from *Minháj-u-deen*, and had records at *Patna* of his family's genealogy to the present time. What credit is due to this I will not pretend to say; but the room is certainly now frequented  
by



by *Mohummedans*, and has been for some time, as there are the remains of an old mosque close before it; and within a raised terrace, such as the *Mohummedan* devotees are used to construct for their religious retirement. There are two inscriptions, one on each side of the interior part of the entrance; impressions of both which my *Moon/hee* took off in the course of three days, with much trouble, and sufficient accuracy, to enable Mr. *Wilkins* to understand and explain the whole of one; though many *Pandits*, I was informed, who had seen the original engraving, had attempted in vain to decypher it. The other, which consists of one line only, is unfortunately of a different character, and remains still unintelligible.

The following letter and remarks, which Mr. *Wilkins* has favored me with, make it unnecessary for me to say any thing of the contents of the inscription. I can only regret with him that the date is yet undiscovered; as what is now but a gratification of curiosity, might then have been a valuable clue to the illustration of obscure events in ancient history. There are, however, several other *caves* in the adjoining hills, which I likewise visited, but had not time to take the inscriptions: and from these, I hope, a date will be discovered.

Were any other testimony, besides the inscriptions, wanted, to shew that these *caves* were religious temples, the remains of three defaced images near another, which I visited, called *Curram Choffar*, would be sufficient proof of it. A third, the name of which I could not learn, has its entrance very curiously wrought with elephants, and other ornaments, of which I hope in a short time to present a drawing to the Society.

A LETTER

THE UNIVERSITY OF CHICAGO

PHYSICS DEPARTMENT

REPORT OF THE

COMMISSIONERS OF THE

BOARD OF EDUCATION

FOR THE YEAR 1900

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उक्ते उक्तार उक्तान् विप्रमदय मे वक्ष्यस्व समाप्तिं द्वितीयः पद्यः  
उनिट्ससो रहस्यसकलागशिषशाभरचा सा वहनहिषासुरस्य शिरसिन्यल्लक्षणत्रपुरः

८३४६३१ कर्त्तव्यं च तदर्थं वाञ्छन्ते मयि रिक्तबुद्ध्या ध्रुवचंद विष्णुपुत्रः देसंपरः  
देवात्मपरमभक्तिवादसदृशा सुज्ञानफलनाशिन दिष्टा दच्चनसाङ्गजालजलितपादपदंस नद

ॐ ऐं ह्रीं क्लीं नमः शिवाय नमः ॥ प्रथमोऽध्यायः ॥ अथ श्रीगणेशस्तोत्रम् ॥  
श्रीगणेशाय नमः ॥

प्रह्लाद उवाच ॥ अथ ब्रूयात्तु त्वं मया शृणुष्यते ॥  
प्रह्लाद उवाच ॥ अथ ब्रूयात्तु त्वं मया शृणुष्यते ॥

त्रैलोक्यमद्वयप्रभा चक्षुषा तन्मयः तद्वत्तुद्वयगोष्ठं तद्वत्तुद्वयगोष्ठं तद्वत्तुद्वयगोष्ठं तद्वत्तुद्वयगोष्ठं  
 तस्यावर्णमस्तु तन्मयमरणया पारलब्धयः नानाककुदं मखरु ककुभा किक्षाजिने दपुगः

[illegible]

नक्षत्रं च मन्त्रं च कर्म च विद्या च श्रद्धा च पुण्यं च निवृत्तिरुत्तमा विद्यापञ्चमस्तु न  
नस्यानलमलक्षिप्रिमशसो नलादिव म्याख्या लान्नोदिनपक्रिभावि विपा पुत्रेण पूजो नम न

ॐ स्वस्ति नमो भगवते वासुदेवाय । अथ श्रीकृष्णार्चनम् ॥  
आत्मानं विन्दन् चित्तं रक्तमिषं पुण्यात्पदवर्द्धितं । सित्यसाद्युतवित्प्रभू च रघुसमाश्रितैकात्म्येन

ॐ नमो भगवते वासुदेवाय ॥ ॐ नमो भगवते वासुदेवाय ॥ ॐ नमो भगवते वासुदेवाय ॥  
 ॐ नमो भगवते वासुदेवाय ॥ ॐ नमो भगवते वासुदेवाय ॥ ॐ नमो भगवते वासुदेवाय ॥

मधुवृषविशयं त्रिगर्भं ॥ ३५ ॥ दत्तं ॥ निः ॥ अथ यवक्यं कर्म ॥ अंतां ॥ अंतां ॥ अंतां ॥  
 अथ यवक्यं कर्म ॥ अंतां ॥ अंतां ॥ अंतां ॥ अंतां ॥ अंतां ॥ अंतां ॥

A LETTER  
FROM  
CHARLES WILKINS, Esq.  
TO  
THE SECRETARY.

DEAR SIR,

HAVING been so fortunate as to make out the whole of the very curious Inscription you were so obliging as to lend me, I herewith return it, accompanied by an exact Copy, in a reduced size, interlined with each corresponding letter in the modern *Děwnāgār* character; and also a Copy of my Translation, which is as literal as the idioms would admit it to be.

The character is undoubtedly the most ancient of any that have hitherto come under my inspection. It is not only dissimilar to that which is now in use, but even very materially different from that we find in inscriptions of eighteen hundred years ago. But though the writing be not modern, the language is pure *Sam-skreet*, written in a long verse, called *Sārdōolā-věěkrēē-rěētā*, and consists of four pauses, of nineteen syllables each, in this form:

---o o-o-o-o o o---o---o-1---o o-o-o o o---o---o-  
---o o-o-o-o o o---o---o-1---o o o-o-o o o---o---o-

The metre was no small help in decyphering the vowels.

The



The first lines of the first verse allude to the story of *Bhāwānēē*'s killing the evil spirit *Māhēēshāsoōr*, who, in the disguise of a buffalo, as the name imports, had fought with *Eendrā*, and his celestial bands, for a hundred years, defeated him, and usurped his throne. The story is to be found at large in a little book called *Chandee*. The vanquished spirits, being banished the heavens, and doomed to wander the earth, after a while assemble, with their chief *Eendrā* at their head, and resolve to lay their grievances before *Vēēshnōō* and *Sēēv*. Conducted by *Brāhmā*, they repair into the presence of those Deities, who heard their complaints with compassion; and their anger was so violent against *Māhēēshāsoōr*, that a kind of flame issued from their mouths, and from the mouths of the rest of the principal Gods, of which was formed a Goddess of inexpressible beauty with ten arms, and each hand holding a different weapon. This was a transfiguration of *Bhāwānēē*, the consort of *Sēēv*, under which she is generally called *Dōōrgā*. She is sent against the usurper. She mounts her lion, the gift of the mountain *Hēēmālāy*, (*snowy*,) and attacks the monster, who shifts his form repeatedly; till at length the Goddess *planteth her foot upon his head*, and cuts it off with a single stroke of her sword. Immediately the upper part of a human body issues through the neck of the headless buffalo, and aims a stroke, which being warded off by the lion with his right paw, *Dōōrgā* puts an end to the combat, by piercing him through the heart with a spear. I have in my possession a statue of the Goddess, with one foot on her lion, and the other on the monster, in the attitude here lastly described.

The want of a date disappointed my expectations. I had some hopes that it was contained in the single line, which you informed me was taken from another part of the *cave*; but, although I have not yet succeeded in making out the whole, I have discovered enough to convince me that it contains nothing but an invocation.

If

If you should be so fortunate as to obtain correct copies of the rest of the Inscriptions that are to be found in the *Caves* of those mountains, I make no doubt but that we shall meet with some circumstance or other, that will guide us to a discovery of their antiquity.

I have the pleasure to subscribe myself,

DEAR SIR,

Your very sincere Friend,

And obedient humble Servant,

CHARLES WILKINS.

*Calcutta, 17th March, 1785.*



A

## TRANSLATION

OF A

## SANSKRIT INSCRIPTION.

**W**HEN the foot of the Goddess (*a*) was, with its tinkling ornaments, planted upon the head of *Māhēēśhāsōōr*, (*b*) all the bloſſom of the new-blown flower of the fountain (*c*) was diſperſed with diſgrace by its ſuperior beauty. May that foot, radiant with a fringe of refulgent beams iſſuing from its pure bright nails, endue you with a ſteady and an unexampled devotion, offered up with fruits, and ſhew you the way to dignity and wealth!

The illuſtrious *Yāgnā Vārmā* was a Prince whoſe greatneſs conſiſted in free-will offerings. His reputation was as unſullied as the moon. He was renowned amongſt the Martial Tribes; and although he was, by deſcent, by wiſdom, courage, charity, and other qualities, the fore-leader of the royal line; yet, from the natural humility of his temper, he diſturbed not the powerful ocean.

His auſpicious ſon, *Sārdōōlā Vārmā*, a Prince whoſe magnificence flowed, as it were, from the tree of imagination, (*d*) diſplayed the enſign of royalty in ſacrifices, and

(*a*) *Bhāwānēē* the wife of *Seer*.

(*b*) The name of an evil Spirit.

(*c*) Epithet of the lotus.

(*d*) In the original *Kālpā-tārōō*, a fabulous tree which yielded every thing that was demanded.

and the world was subdued by his infinite renown. He gratified the hopes of relations, friends, and dependants; and honor was achieved from the deed of death (e) near the uprising ocean.

By his pious son, called *Ānāntā Vārmā* because of his infinite renown, the holy abode of us contemplative men, who are always studious for his good, and employed in his service, hath been increased, and rendered famous, as long as the Earth, the Sun, and Moon, and starry Heaven, shall endure; and *Kātyāyānēē* (f) having taken sanctuary, and being placed, in this cavern of the wonderful *Veen'dyā* (g) mountains.

The holy Prince gave unto *Bhāwānēē*, in perpetuity, the village ————— (h) and its hilly lands, by whose lofty mountain-tops the sunny beams are cast in shade. Its filth and impurities are washed away by the precious stores of the *Māhānāḍā*, (i) and it is refreshed by the breezes from the waving *Prēyāngōōs* (k) and *Bākōōlās* (l) of its groves

## X 2

## TRANSLATION

(e) He was probably carried to *Gāngā-Sāgār* to die.

(f) One of the names of *Dōōrgā* or *Bōwānēē*.

(g) The name of the chain of mountains which commences at *Chunar*.

(h) The name, which consisted of two long syllables, is wanting in the original.

(i) Probably the river called the *Mahonah* in RENNEL'S Map of South *Bahar*.

(k) Probably the *Champa*.

(l) *Moulserce*.



## XI.

## TRANSLATION

OF A

## SANSKRIT INSCRIPTION,

COPIED FROM A STONE AT BOODDHA GAYA,

BY MR. WILMOT, 1785.

*Translated by CHARLES WILKINS, Esq.*

IN the midst of a wild and dreadful forest, flourishing with trees of sweet-scented flowers, and abounding in fruits and roots, infested with lions and tigers, destitute of human society, and frequented by the *Moonees*, resided *Bööd-dhă*, the Author of Happiness, and a portion of *Narayan*. This Deity *Hăřěě*, who is the Lord *Hăřēēsa*, the possessor of all, appeared in this ocean of natural Beings at the close of the *Devāpără*, and beginning of the *Kălěě Yoog*. He who is omnipresent, and everlastingly to be contemplated, the Supreme Being, the Eternal One, the Divinity worthy to be adored by the most praise-worthy of mankind, appeared here with a portion of his divine nature.

Once upon a time the illustrious *Āmăřă*, renowned amongst men, coming here, discovered the place of the Supreme Being, *Bööd-dhă*, in the great forest. The wise *Āmăřă* endeavoured to render the God *Bööd-dhă* propitious by superior service; and he remained in the forest for the space of twelve years, feeding upon roots and fruits, and sleeping upon the bare earth; and he performed the vow of a *Moonee*, and was without transgression.

gression. He performed acts of severe mortification, for he was a man of infinite resolution, with a compassionate heart. One night he had a vision, and heard a voice saying, "Name whatever boon thou wantest." *Āmāra Dēvā*, having heard this, was astonished, and with due reverence replied, "First, give me a visitation, and then grant me such a boon." He had another dream in the night, and the voice said, "How can there be an apparition in the *Kālēś Yoog*? The same reward may be obtained from the sight of an image, or from the worship of an image, as may be derived from the immediate visitation of a Deity." Having heard this, he caused an image of the Supreme Spirit *Bōōd-dhā* to be made, and he worshipped it, according to the law, with perfumes, incenses, and the like; and he thus glorified the name of that Supreme Being, the incarnation of a portion of *Veeśhnōo*: "Reverence be unto thee in the form of *Bōōd-dhā*! Reverence be unto the Lord of the Earth? Reverence be unto thee, an incarnation of the Deity and the Eternal One! Reverence be unto thee, O God, in the form of the God of Mercy: the dispeller of pain and trouble, the Lord of all things, the Deity who overcometh the sins of the *Kālēś Yoog*, the Guardian of the Universe, the Emblem of Mercy toward those who serve thee—*O'm*! the possessor of all things in vital form! Thou art *Brāhmā*, *Veeśhnōo*, and *Māhēśa*! Thou art Lord of the Universe! Thou art, under the proper form of all things, moveable and immoveable, the possessor of the whole! and thus I adore thee. Reverence be unto the Bestower of Salvation, and *Reshēekēsā*, the Ruler of the Faculties! Reverence be unto thee (*Kēsavā*) the Destroyer of the Evil Spirit *Kēśee*! O, *Dāmōrdārā*, shew me favour! Thou art he who resteth upon the face of the milky ocean, and who lyeth upon the serpent *Sēsā*. Thou art *Trēēviēkrāmā*, who at three strides encompassed the Earth! I adore thee, who art celebrated by a thousand names, and under various forms, in the shape of

" *Bōōd-*



“*Bhōd-dhā*, the God of Mercy! Be propitious, O Most High God!”

Having thus worshipped the Guardian of Mankind, he became like one of the just. He joyfully caused a holy temple to be built, of a wonderful construction, and therein were set up the divine foot of *Veeśhnoo*, for ever purifier of the sins of mankind, the images of the *Pāndōos*, and of the descents of *Veeśhnoo*: and in like manner of *Brāhmā*, and the rest of the Divinities.

This place is renowned; and it is celebrated by the name of *Bhōd-dhā Gāyā*. The forefathers of him who shall perform the ceremony of the *Sradha* at this place shall obtain salvation. The great virtue of the *Sradha* performed here, is to be found in the book called *Vāyēō-pōōrānā*: an Epitome of which hath by me been engraved upon stone.

*Vēēkrāmādeētya* was certainly a king renowned in the world. So in his court there were nine learned men, celebrated under the epithet of the *Nāvā-ratnānēē*, or *nine jewels*; one of whom was *Āmārā Dēvā*, who was the king's chief counsellor, a man of great genius and profound learning, and the greatest favourite of his prince. He it certainly was who built the holy temple, which destroyeth sin, in a place in *Jamboodweep*, where the mind being steady, it obtains its wishes; and in a place where it may obtain salvation, reputation, and enjoyment, even in the country of *Bhārātā*, and the province of *Kēēkātā*, where the place of *Bhōd-dhā*, purifier of the sinful, is renowned. A crime of an hundred-fold shall undoubtedly be expiated from a sight thereof, of a thousand-fold from a touch thereof, and of a hundred thousand-fold from worshipping thereof. But where is the use of saying so much of the great virtues of this place? Even the hosts of heaven worship with joyful service both day and night.

That

That it may be known to learned men, that he verily erected the house of *Bōd-dhā*, I have recorded, upon a stone, the authority of the place, as a self-evident testimony, on Friday, the fourth day of the new moon, in the month of *Madhoo*, when in the seventh or mansion of *Gānisa*, and in the year of the *Era of Vēṣkramādēṣṭya* 1005.



## XII.

To ————

SECRETARY to the ASIATICK SOCIETY.

S I R,

BEFORE I left *Calcutta*, a Gentleman, with whom I chanced to be discoursing of that sect of people who are distinguished from the worshippers of *Brāhmā*, and the followers of *Mahommed*, by the appellation *Seek*, informed me that there was a considerable number of them settled in the city of *Patna*, where they had a College for teaching the tenets of their philosophy. As *Patna* was in my way to *Banaris*, I no sooner arrived there, than I inquired after the College, and I was presently conducted to it; and I now request you will please to lay before the Society the few Observations and Inquiries which a single visit of about two hours would admit of my making. If, such as they are, they should hereafter be found useful, either as a clue to guide another in his researches in the same path, or to add to some future account to render it more complete, my end in troubling you to lay it before the Society is fully answered.

I have the honour to subscribe myself,

S I R,

Your most obedient humble Servant,

CHARLES WILKINS.

*Banaris, 1st March, 1781.*

*Observations on the Seekers and their College.*

I FOUND the College of the *Seekers* situated in one of the narrow streets of *Patna*, at no very considerable distance from the Custom-house. I was permitted to enter the outward gate; but as soon as I came to the steps which led up into the Chapel, or public hall, I was civilly accosted by two of the Society. I asked them if I might ascend into the hall. They said it was a place of worship, open to me and to all men; but, at the same time, intimated, that I must take off my shoes. As I considered this ceremony in the same light as uncovering my head upon entering any of our temples dedicated to the Deity, I did not hesitate to comply; and I was then politely conducted into the hall, and seated upon a carpet in the midst of the assembly, which was so numerous as almost to fill the room. The whole building forms a square of about forty feet, raised from the ground about six or eight steps. The hall is in the center, divided from four other apartments by wooden arches, upon pillars of the same materials, all neatly carved. This room is rather longer than it is broad. The floor was covered with a neat carpet, and furnished with six or seven low desks, on which stood as many of the books of their law; and the walls, above the arches, were hung with European looking-glasses in gold frames, and pictures of *Mussulman* Princes and *Hindoo* Deities. A little room, which, as you enter, is situated at the left-hand end of the hall, is the chancel, and is furnished with an altar covered with a cloth of gold, upon which was laid a round black shield over a long broadsword, and on either side a *chowry* of peacock's feathers, mounted in a silver handle. The altar was raised a little above the ground, in a declining position. Before it stood a low kind of throne, plated with silver; but rather too small to be useful: about it were several



veral silver flower-pots and rose-water bottles ; and on the left hand stood three small *urns*, which appeared to be copper, furnished with notches to receive the donations of the charitable. There stood also near the altar, on a low desk, a great book, of a folio size, from which some portions are daily read in their divine service. It was covered over with a blue mantle, on which were printed, in silver letters, some select passages of their law.

After I had had a long conversation with two of the congregation, who had politely seated themselves on each side of me on the carpet, and whom I found very intelligent, notice was given that it was noon, and the hour of divine service. The congregation arranged themselves upon the carpet, on each side of the hall, so as to leave a space before the altar from end to end. The great book, desk, and all, was brought with some little ceremony from the altar, and placed at the opposite extremity of the hall. An old man, with a reverend silver beard, kneeled down before the desk with his face towards the altar ; and on one side of him sat a man with a small drum, and two or three with cymbals. The book was now opened, and the old man began to chant to the time of the drum and the cymbals ; and, at the conclusion of every verse, most of the congregation joined chorus in a response, with countenances exhibiting great marks of joy. Their tones were by no means harsh ; the time was quick : and I learnt that the subject was a Hymn in praise of the unity, the omnipresence, and the omnipotence, of the Deity. I was singularly delighted with the gestures of the old man : I never saw a countenance so expressive of inexpressible joy, whilst he turned about from one to the other, as it were, bespeaking their assents to those truths which his very soul seemed to be engaged in chanting forth. The Hymn being concluded, which consisted of about twenty verses, the whole congregation got up, and presented their  
faces

faces with joined hands towards the altar, in the attitude of prayer. A young man now stood forth; and, with a loud voice and distinct accent, solemnly pronounced a long prayer, or kind of liturgy, at certain periods of which all the people joined in a general response, saying, *Wā Gooroo!* They prayed against temptation; for grace to do good; for the general good of mankind; a particular blessing to the *Seeks*; and for the safety of those who at that time were on their travels. This prayer was followed by a short blessing from the old man, and an invitation to the assembly to partake of a friendly feast. The book was then closed, and restored to its place at the altar; and the people being seated as before, two men entered, bearing a large iron caldron, called a *curray*, just taken from the fire, and placed it in the center of the hall upon a low stool. These were followed by others with five or six dishes, some of which were of silver, and a large pile of leaves, sewed together with fibres, in the form of plates. One of these plates was given to each of the company without distinction; and the dishes being filled from the caldron, their contents were served out till every one had got his share. Myself was not forgotten; and, as I was resolved not to give them the smallest occasion for offence, I ate up my portion. It was a kind of sweetmeat, of the consistence of soft brown sugar, composed of flower and sugar mixed up with clarified butter, which is called *ghee*. Had not the *ghee* been rancid, I should have relished it better. We were next served with a few sugar plums: and here ended the feast, and the ceremonies of the day. They told me the religious part of the ceremony was daily repeated five times. I now took my leave, inviting some of the principal men amongst them, who were about to return to their own country through *Banaris*, to pay me a visit.

In the course of the conversation I was engaged in with the two *Seeks* before the service, I was able to  
gather



gather the following circumstances. That the founder of their faith was called *Nāneek Sah*, who flourished about four hundred years ago at *Punjab*, and who, before his apostasy, was a *Hindoo* of the *Kshétry*, or military tribe; and that his body disappeared as the *Hindoos* and the *Mussulmans* were disputing for it; for upon their removing the cloth which covered it, it was gone. That he left behind him a book, composed by himself, in verse, and the language of *Punjab*, (but a character partly of his own invention,) which teaches the doctrines of the faith he had established. That they call this character, in honour of their founder, *Gooroo-Mookhee*: “*from the mouth of the preceptor.*” That this book, of which that standing near the altar, and several others in the hall, were copies, teaches that there is but one God, omnipotent and omnipresent; filling all space, and pervading all matter; and that he is to be worshipped and invoked. That there will be a day of retribution, when virtue will be rewarded and vice punished; (I forgot to ask in what manner.) That it not only commands universal toleration, but forbids disputes with those of another persuasion. That it forbids murder, theft, and such other deeds as are, by the majority of mankind, esteemed crimes against society; and inculcates the practice of all the virtues, but particularly an universal philanthropy, and a general hospitality to strangers and travellers. This is all my short visit would permit me to learn of this book. It is a folio volume, containing about four or five hundred pages.

They told me further, that some years after this book of *Nāneek Sah* had been promulgated, another made its appearance, now held in almost as much esteem as the former. The name of the author has escaped my memory; but they favoured me with an extract from the book itself in praise of the Deity. The passage had struck my ear on my first entering the hall, when the students

students were all engaged in reading. From the similarity of the language to the *Hindoovee*, and many *Shanscrit* words, I was able to understand a good deal of it; and I hope, at some future period, to have the honour of laying a Translation of it before the Society. They told me I might have copies of both their books, if I would be at the expense of transcribing them.

I next inquired why they were called *Seeks*, and they told me it was a word borrowed from one of the commandments of their founder, which signifies, “*Learn thou;*” and that it was adopted to distinguish the sect soon after he disappeared. The word, as is well known, has the same import in the *Hindoovee*.

I asked them what were the ceremonies used in admitting a profelyte. A person having shewn a sincere inclination to renounce his former opinions to any five or more *Seeks* assembled together, in any place, as well on the highway as in a house of worship, they send to the first shop where sweetmeats are sold, and procure a small quantity of a particular sort, which is very common, and, as I recollect, they call *Batāfā*; and having diluted it in pure water, they sprinkle some of it on the body, and into the eyes of the convert; whilst one of the best instructed repeats to him, in any language with which he is conversant, the chief canons of their faith, exacting from him a solemn promise to abide by them the rest of his life. This is the whole of the ceremony. The new convert may then choose a *Gooroo*, or preceptor, to teach him the language of their scriptures, who first gives him the alphabet to learn, and so leads him on, by slow degrees, until he wants no further instruction. They offered to admit me into their Society; but I declined the honour; contenting myself with the alphabet; which they told me to guard as the apple of my



my eye, as it was a sacred character. I find it differs but little from the *Dewnagur* : the number, order, and powers of the letters are exactly the same. The language itself is a mixture of *Persian*, *Arabick*, and some *Shanscrit*, grafted upon the provincial dialect of *Punjab*, which is a kind of *Hindoovee*, or, as it is vulgarly called by us, *Moors*.

## XIII.

## AN EXTRACT OF A LETTER

FROM

FRANCIS FOWKE, Esq.

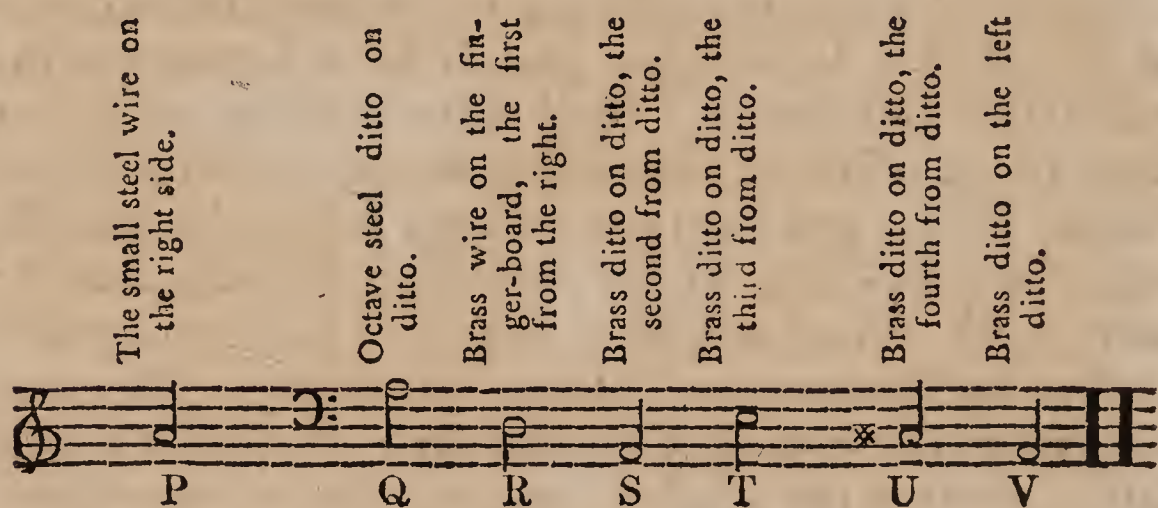
TO THE PRESIDENT.

THE drawings of *Feewun Shah* and the *Been* will be dispatched in a small boat to-morrow. You wished to have had the two attendant musicians in the same drawing with *Feewun Shah*; but the draftsman was not equal to the perspective of this: he would have run all the figures one into the other: and as he has succeeded tolerably well with the principal figures, I thought it was better to be sure of that, especially as the other figures can easily be added by a *European* artist. I have a double pleasure in sending you the enclosed account of the *Been*. In obliging you, I look forward to the instructive amusement I shall share with the public at large in the result of your researches into this subject of *Indian* music; and I am exceedingly happy, by furnishing you with facts, highly necessary indeed, but the mere work of care and observation, to give you greater leisure for the contemplation of the whole. You may absolutely depend upon the accuracy of all that I have said respecting the construction and scale of this instrument: it has been done by measurement: and, with regard to the intervals, I would not depend upon my ear, but had the *Been* tuned to the harpsichord, and compared the instruments carefully, note by note, more than once. What I myself am aware of, will certainly not escape your penetration, that there may be a little of the bias of hypothesis, or an opinion pretty strongly established, in what I have said of the confined modulation of the *Indian* music. But it is easy to separate my experiments and conjectures; and my prejudices cannot



cannot mislead you ; though they may possibly suggest a useful hint, as half errors often do.

The *Been* is a fretted instrument of the guittar kind. The finger-board is  $21\frac{6}{8}$ ths inches long. A little beyond each end of the finger-board are two large gourds, and beyond these are the pegs and tail-piece which hold the wires. The whole length of the instrument is three feet seven inches. The first gourd is fixed at ten inches from the top, and the second is about two feet  $11\frac{1}{2}$ . The gourds are very large, about fourteen inches diameter, and have a round piece cut out of the bottom, about five inches diameter. The finger-board is about two inches wide. The wires are seven in number, and consist of two steel ones, very close together, in the right side ; four brass ones on the finger-board ; and one brass one on the left side. They are tuned in the following manner.



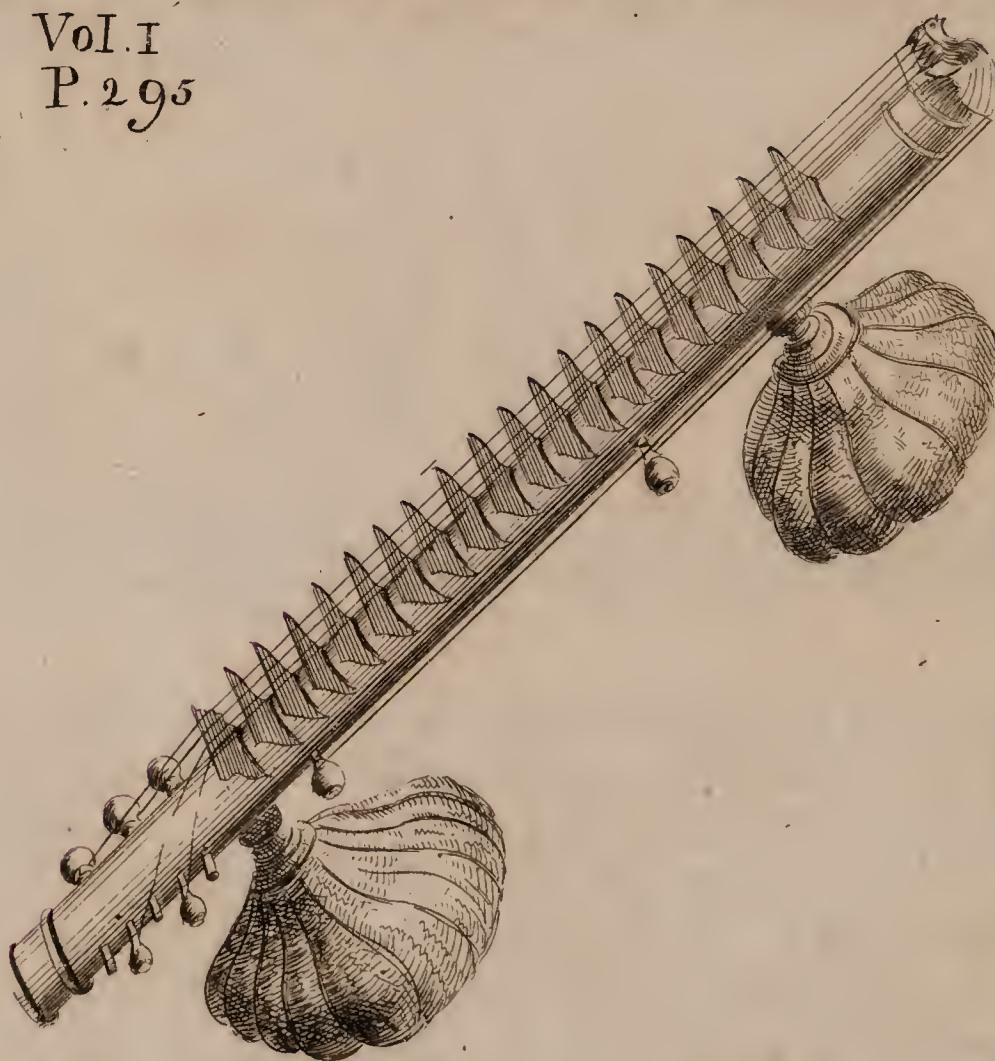
The great singularity of this instrument is the height of the frets ; that nearest the nut is one inch  $\frac{1}{8}$ , and that at the other extremity about  $\frac{7}{8}$ ths of an inch, and the decrease is pretty gradual. By this means the finger never touches the finger-board itself. The frets are fixed on with wax by the performer himself, which he does intirely by ear. This was asserted by *Pear Cawn*, the brother of *Jeerun Shah*, who was ill at the time :  
but







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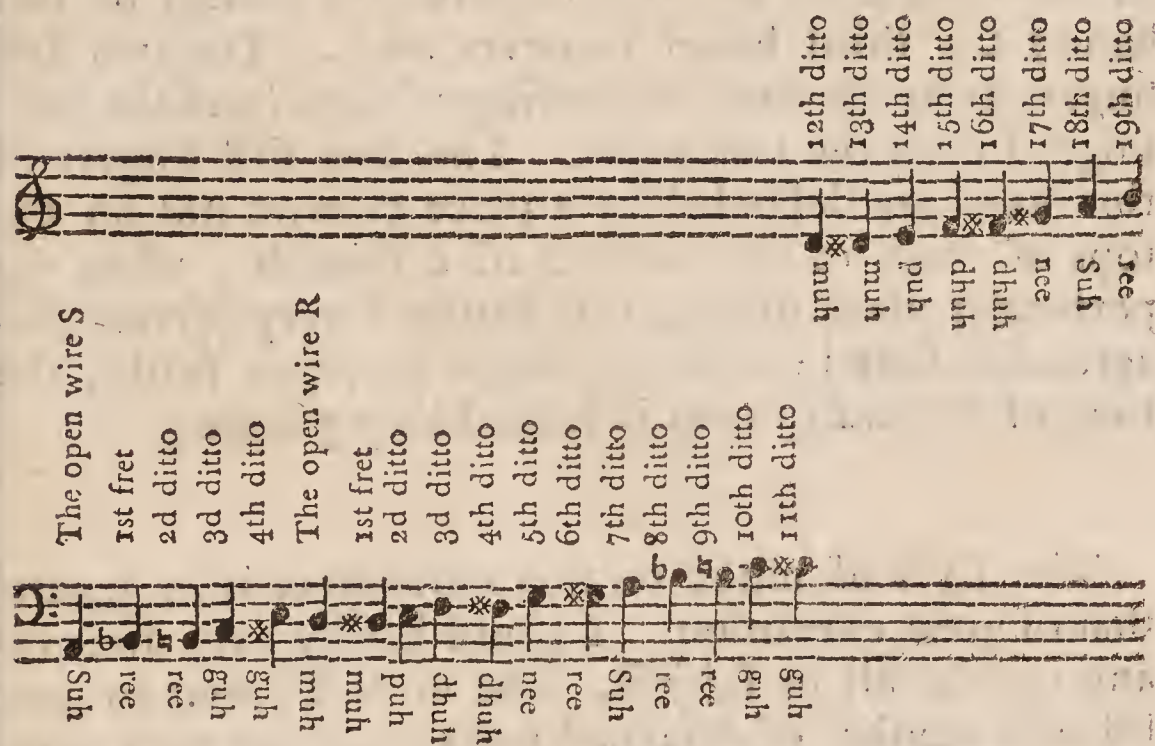
THE VEENA.

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but *Pear Cawn* is a performer very little, if at all, inferior to *Jeewun Shah*. The frets of *Pear Cawn's* instrument were tolerably exact. Any little difference is easily corrected by the pressure of the finger. Indeed, the performers are fond, on any note that is at all long, of pressing the string very hard, and letting it return immediately to its natural tension, which produces a sound something like the close shake on the violin; but not with so agreeable an effect; for it appears sometimes to alter the sound half a tone.

The frets are nineteen in number. The notes that they give will appear on the following scale. I have added below the names which the performer himself gives to the notes in his own language. It is very observable, that the semitones change their names on the same semitone as in the *European* scale.



On the wires R and S, which are those principally used, there is an extent of two octaves, a whole note with all the half notes complete in the first octave, but the g $\sharp$  and b $\flat$  wanting in the second. The performer's apology



logy for this was, that he could easily get those notes by pressing the string a little hard upon the frets *f* and *a*, which is very true from the height of the frets; but he asserted that this was no defect in his particular instrument, but that all *Beens* were made so. The wires *TU* are seldom used, except open.

The *Been* is held over the left shoulder, the upper gourd resting on that shoulder, and the lower one on the right knee.

The frets are stopped with the left-hand; the first and second fingers are principally used. The little finger of the hand is sometimes used to strike the note *V*. The third finger is seldom used, the hand shifting up and down the finger-board with great rapidity. The fingers of the right hand are used to strike the strings of this hand; the third finger is never used. The two first fingers strike the wires on the finger-board, and the little finger strikes the two wires. The two first fingers of this hand are defended by a piece of wire put on the tops of them in the manner of a thimble: when the performer plays strong, this causes a very jarring disagreeable sound; whereas, when he plays softly, the tone of the instrument is remarkably pleasing.

The style of music on this instrument is in general that of great execution. I could hardly ever discover any regular air or subject. The musick seems to consist of a number of detached passages, some very regular in their ascent and descent; and those that are played softly, are most of them both uncommon and pleasing.

The open wires are struck, from time to time, in a manner

manner that, I think, prepares the ear for a change of modulation, to which the uncommonly full and fine tones of these notes greatly contribute; but the ear is, I think, always disappointed: and if there is ever any transition from the principal key, I am inclined to think it is very short. Were there any other circumstances respecting the *Indian* music, which led to suppose that it has, at some period, been much superior to the present practice, the style, scale and antiquity of this instrument, would, I think, greatly confirm the supposition.



## XIV.

## A DESCRIPTION

## OF THE

## M Á H W A H T R E E.

By Lieut. CHARLES HAMILTON.

THERE is a very curious and useful tree, called, by the natives of *Bahar*, and the neighbouring countries, the *Máhwah*, or *Máwee*: but the *Sanfscrit* name is *Madhúca*, or *Madhudruma*.

It is of the class of the Polyandria Monogynia of *Linnaeus*, but of a genus not described by him.

The *calyx* is monophyllous, quadrifid, half divided, and imbricated in its divided part; the two opposite and *outer* covering, in part, the two opposite and *inner* parts.

The *corolla* is monopetalous, having an inflated tube for its lower part, of near an inch long, thick, fleshy, and of a cream colour: from this arise nine small leaves, as it were, like petals, from a calyx, that are imbricated and twisted one over the other, from right to left, clasping the lower part of the style in a point; by which they seem to serve, in some respect, like forceps, to detach the whole *corolla* at the season of its dropping.



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There are no filaments: but the *antheræ*, which are in number most commonly twenty-six, long, scabrous, and spear-headed, are inserted in rows, on the inside and upper part of the tube of the *corolla*.

The *style* is long, round, and tapering, and projects about an inch beyond the *corolla*. It is succeeded by a drupe, with a thick pericarpium, bilocular, containing two seeds or kernels, covered with a dark brown skin. There are often, however, *three* of these in three separate divisions.

The flowers rise in bunches from the extremities of the smaller branches, and have each a pedicle of about an inch and a half long. These are mostly turned downwards, whence the corollas more easily drop off.

The tree, when full grown, is about the size of a common *mango-tree*, with a bushy head, and oval leaves, a little pointed. Its roots spreading horizontally, are sunk but little in the earth. The trunk, which is often of a considerable thickness, rises seldom to any great height, without giving off branches: it is, however, not uncommon to see it shoot up clear to the length of eight or ten feet. The wood itself is moderately hard, fine grained, and of a reddish colour.

By incision, the tree affords a resinous *gum* from the bark.

The flowers are of a nature very extraordinary, differing essentially from those of any other plant with which I am acquainted, as they have not in any respect the usual appearance of such, but rather resemble *berries*; and I, like many others, had long conceived them to be the *fruit* of the *Máhwah*. The tree drops its leaves in the month of February; and early in March these  
flowers



flowers begin to come in clusters of thirty, forty, or fifty, from the extremity of every small branch ; and from this period till the latter end of April, as the flowers come to maturity, (for they never open or expand,) they continue falling off, with their *antheræ*, in the mornings, a little after sun-rise, when they are gathered ; and afterwards dried by an exposure of a few days in the sun. When thus prepared, they very much resemble a dried *grape*, both in taste and flavour.

Immediately after the flowers drop off, fresh shoots are made for the new leaves, which soon make their appearance, coming presently to their full growth.

The fruit (*properly* so called) is of two sorts in shape ; the one resembling a small *walnut* ; the other somewhat larger, and pointed. It is ripe towards the middle of May, and continues dropping from the tree till the whole fall ; which is generally about the beginning, or towards the middle, of June. The outer covering, or *pericarpium*, which is of a soft texture, commonly bursts in the fall, so that the seeds are very easily squeezed out of it. The seeds are somewhat of the shape, but longer than an *olive*.

These seeds are replete with a thick *oil*, of the consistence of *butter* or *ghee*, which is obtained by expression.

From this description it may easily be conceived that the *Máhwah-tree*, and its productions, are of singular and general use, especially in those dry and barren countries which, from the nature of their situation, are not so well calculated for producing in plenty, or perfection, the other necessaries of life.

The

The *corolla*, or flowers, after being dried as before described, are eaten by the natives raw, or dressed with their *curries*; and, when even simply boiled with rice, they afford a strengthening and wholesome nourishment. They are, indeed, often applied to a less laudable purpose; for being fomented, they yield, by distillation, a strong spirit, which the people here sell so very cheap, that for *one pice* (about a halfpenny) may be purchased no less than a *cutcha feer*, (above a pint *English*,) with which any man may get completely drunk. These flowers make an article of trade; being exported from this country to *Patna*, and elsewhere, in no inconsiderable quantities.

The *oil* yielded by the fruit, as before-mentioned, resembles *ghee* so much, that, being cheaper, the natives often mix it with that commodity. They use it, the same as *ghee*, in their victuals, and in the composition of some sorts of sweetmeats; and burn it in their lamps. It is also regarded as a salutary remedy, applied exteriorly to wounds, and all cutaneous eruptions. It is, at first, of the consistence of common *oil*, but soon coagulates. After being kept for some time, it acquires a bitterish taste and rancid smell, which renders it somewhat less agreeable as an article of food; but this is an inconvenience, which, by the *oil* being properly clarified, and prepared at first, might be perhaps avoided. This *oil* is also exported, both in its adulterated and original state, to *Patna*, and other parts of the low country.

I do not know any purpose to which the *gum* has ever been applied; but if found, upon trial, to be of use, it might be collected in large quantities. The best seasons for this would be in the months of March and April, about the time the flowers came out, when the  
tree



tree seems to be most replete with it. Such an operation, indeed, would probably diminish its produce in the fruit and flower; but, where it was sufficiently cultivated, the loss in those could be but little felt.

The wood, from what has been already said of it, cannot be expected to be often had in beams of any considerable length, so as to make it so very useful in building, as it would otherwise be, from its not being liable to be eat by the white ants. Mr. *Keir*, however, tells me that, when he was at *Chowfee*, (a village upon the *Caramnassa*, near *Buxar*,) he had beams of it, which were, to the best of his remembrance, above twenty feet long. But in many other respects it is a most useful wood; and, as it is tough, and of a strong texture, it might, perhaps, be employed to advantage in ship-building, in which case, if properly cultivated in many grounds that seem well adapted for it, and fit for little else, it might thus in time become a valuable article in that branch at *Calcutta*, whither it could easily be transported during the rainy season, from almost any part of these countries, by several rivers that are then sufficiently full to float it down.

The tree, I am told, will grow in the most barren ground, even amongst stones and gravel, where there is the least appearance of a soil; and it seems to destroy all the smaller trees and brushwood about it; yet it does not refuse a *rich* soil either: Mr. *Keir* having observed to me, that the few he had seen about *Buxar*, where it is certainly very good, were both taller, and seemed to thrive much better, than any he had ever met within *Ramgur*. It does not require much *moisture*, seeming to produce nearly as well in the driest as in most favorable years; and in every situation; and is therefore admirably fitted for the convenience of the inhabitants of these hilly

hilly countries, which are peculiarly subject to long and severe droughts during the hot months.

Yet, notwithstanding its utility, and the immense quantity of ground that seems so well adapted to the growth of it, both here, and in the neighbouring provinces of *Catak*, *Pacheet*, *Rotas*, &c. (the greatest part of which, indeed, seems fit for no other useful production,) I have myself never observed, nor can I find any of my acquaintance who ever have remarked, one single tree in its infant state. We can see, every where, *full grown* trees in great abundance; but never meeting with any young plants, both I, and all whom I have spoken to on the subject, are at some loss to conceive how they should have come here. Neither can the country people themselves, of whom I have enquired, give any rational account of this: although it appears pretty evident that numbers of them must have been cultivated some time or other, every village having many of them growing about it.

This is a circumstance which sufficiently marks the true character of the lower order of natives in their most supine indolence and sloth; owing chiefly, perhaps, to the ignorant and stupid rapacity of their *Rajahs*, *Zimeendars*, and other *landholders*, and their total inattention to the welfare of those dejected wretches, from whom they derive their consequence and power. Of their base indifference to the interests of those whom they thus affect to hold beneath their regard, many striking instances occurred to me in the course of my enquiries upon this very subject; and it was not long ago that, asking some questions concerning the *Máhwah* of a *Zimeendar* in this neighbourhood, he answered, that “it was the food of the *poor* people, and how should  
“ *he* know any thing about it!”



It was this strange neglect of the culture of it, and a knowledge of its usefulness, which first led me to enquire into the nature of this tree, from which the bulk of the people hereabouts already draw such great benefits; in order to know whether they might not increase it without any great trouble to themselves; and whether thereby the revenue might not also be increased, and a certain provision be made against famines, from which the natives often suffer severely in these higher districts.

To effect this, it would be necessary to give the *ryots* every possible encouragement to raise the tree from the seeds; but as the torpid apathy of these people, whether natural or acquired, will ever prevent their being moved to any exertion by a prospect, however alluring, of *distant* advantage, I apprehend the only way of bringing this about, would be making the planting and raising of a certain number of *Máhwahs* (in proportion to the value of the tenure) an article in their *Kabuleeats*, or agreements.

The tree, as has been already observed, will grow almost any where. It ought to be sown about the beginning of the rains, either in beds (to be afterwards transplanted) or at about thirty or forty feet distance, in the ground designed for it. It is said that, in seven years, the trees will give flowers and fruit; in ten, they will yield about half their common produce; and that in twenty years they come to their full growth; after which, if my information be good, they will last near one hundred years. This account, I acknowledge, must necessarily be very vague and uncertain, as I never have met with a single person who appeared to have had either opportunity or inclination to observe its progress. Such, however, is what the country people say of it.

I am told that a good tree will easily give four *puckha maunds* (about three hundred weight averdupois) of dried flowers, which will sell here for about two *rupees*; and of seeds it will afford about two *maunds*; and this of oil will yield twenty-six *seers puckha* weight, (near 60*lb.*) which, in a year like this, when oil is cheap, will sell at this place for two *rupees* more. It is to be observed, however, that *every* tree will not give so much; neither are the flowers and *oil* so clear in any part of the hills as at *Chatra*; but, allowing only *half* of this, or less, to be the product of each tree, (though it might be rendered still much greater by the very least care and industry in the cultivation of it,) within the space of twenty years, a subsistence might be raised to the inhabitants, and a considerable revenue to the proprietors of the lands, throughout an immense tract of country; the greatest part of which, in its present state, is little better than a barren waste, and cannot pay one single *anna* to the *Zimeendar* or the Government. That such an advantage might be derived from it, may be proved by the most moderate calculation; for, supposing the trees to be sown at about forty feet distance from each other, on each *begah* (about the third of an acre) might stand eight trees; and, supposing the product of each tree to be only *half a rupee*, there would be *four rupees* of *annual value* on a *begah* of ground; half of which going to the proprietor, it would thus give a far better rent than the generality of the best grounds in these parts; and the labourer would have a produce, without any other trouble than that of sowing the seed, and fencing the ground whilst the trees were young; and that of annually gathering the flowers, and preparing the *oil*, when they arrive at their proper size; and they would probably begin to give a produce within less than ten years after the sowing.

As this tree will yield nearly its usual quantity of flowers and fruit in seasons when, for want of rain,  
every



every other crop fails, if thus cultivated, it would afford the inhabitants a sure and certain resource, under the most dreadful, and what has hitherto been, to them, the most destructive, of all calamities, famine. It is well known that the rice, and other sorts of grain, which form the chief part of their sustenance, require a considerable degree of moisture to bring them to perfection. An unusually dry season destroys the harvest in those articles, and reduces the *ryots* in general to the utmost misery; a predicament into which they could hardly fall, even in the severest dearth of grain, whilst they had plenty of the flowers and fruit of the *Máhwah* to depend upon.

It may be here not improper to observe, that Mr. *Keir* is now sowing a few acres with the seed of this useful tree, and means to fence it; which may, perhaps, in time, tempt others to follow so good an example.

*Chatra, Ramgur, July 6, 1785.*

## XV.

OF THE

## METHOD OF DISTILLING

AS PRACTISED BY THE NATIVES AT CHATRA IN RAMGUR, AND IN THE OTHER PROVINCES, PERHAPS WITH BUT LITTLE VARIATION.

By ARCHIBALD KEIR, Esq.

THE body of the still they use is a common, large, unglazed, earthen water jar, nearly globular, of about twenty-five inches diameter at the widest part of it, and twenty-two inches deep to the neck, which neck rises two inches more, and is eleven inches wide in the opening. Such, at least, was the size of the one I measured; which they filled about a half with fomented *Máhwah flowers*, that swam in the liquor to be distilled.

The jar they placed in a furnace, not the most artificial, though seemingly not ill adapted to give a great heat with but very little fuel. This they made by digging a round hole in the ground, about twenty inches wide, and full three feet deep; cutting an opening in the front, sloping down to the bottom, on the sides perpendicular, of about nine inches wide, and fifteen long, reckoning from the circle where the jar was to come, to serve to throw in the wood at, and for a passage to the air. On the side too they cut another small opening, of about four inches by three; the jar when placed, forming one side of it, to serve as a chimney for the smoke to go out at. The bottom of the earth was rounded up like a cup. Having then placed the jar in this, as far as it would go down, they covered it above,  
all



all round, with clay, except at the two openings, till within about a fifth of its height; when their furnace was completed.

In this way I reckon there was a full third of the surface of the body of the still, or jar, exposed to the flame, when the fire came to be lighted; and its bottom, not reaching to within two feet of where the fuel was, left a capacious hollow between them, whence the wood, that was short and dry, when lighted, being mostly converted into flame, and circulating on so great a surface of the still, gave a much stronger heat than could else have been produced from so very little fuel; a consideration well worth the attention of a manufacturer, in our country more especially, where firing is so dear. There, indeed, and particularly as coal is used, it would be better, no doubt, to have a grate, and that the air should enter from below. As to the benefit resulting from the body of the still being of earthen-ware, I am not quite so clear in it. Yet, as lighter substances are well known to transmit heat more gradually and slowly than the more solid, such as metals, may not earthen vessels, on this account, be less apt to burn their contents, so as to communicate an empyreumatick taste and smell to the liquor that is distilled, so often, and so justly, complained of with us? At any rate, in this country, where pots are made so cheap, I should think them greatly preferable, as, at least, much less expensive than those which the Gentlemen engaged in this manufacture most commonly employ: though of this they are best able to judge.

Having thus made their furnace, and placed the body of the still in it, as above described, they to this luted on, with moistened clay, to its neck, at the opening, what they here call an *adkur*; forming with it, at once, a cover for the body of the still, with a suitable perforation in it to let the vapour rise through, and the under part of the alembick. The *adkur* was  
made

made with two earthen pans, having round holes in their middles, of about four inches diameter; and, their bottoms being turned opposite the one to the other, they were cemented together with clay; forming a neck of junction thus of about three inches, with the small rising on the upper pan. The lowermost of these was more shallow, and about eleven inches wide, so as to cover exactly the opening at the neck of the jar, to which they luted it on with clay. The upper and opposite of these was about four inches deep, and fourteen inches wide, with a ledge round its perforation in the middle, rising, as is already said, from the inner side of the neck, of about half an inch high, by which a gutter was formed to collect the condensed spirit as it fell down; and from this there was a hole in the pan to let it run off by; to which hole they occasionally luted on a small hollow *bamboo*, of about two feet and a half in length, to convey it to the receiver below. The upper pan had also another hole in it, of about an inch square, at near a quarter of its circumference from the one below just spoken of, that served to let off the water employed in cooling; as shall be mentioned presently.

Their *adkur* being thus fitted to the jar, they completed the alembick by taking a copper pot, such as we use in our kitchens, of about five inches deep, eight wide at the mouth, and ten at the bottom, which was rather flattish; and turning its mouth downward, over the opening in the *adkur*, luted it down on the inside of the jar with clay.

For their cooler they raised a seat, close upon, and at the back part of the furnace, about a foot higher than the bottom of the copper pot. On this they placed a two or three gallon pot, with a round hole, of about half an inch in the side of it; and to this hole,  
before



before they lighted their fire, they luted on a short tube of a like bore; placing the pot, and directing its spout so as that, when filled with water, it threw a constant and uniform stream of it, from about a foot high, or near the center of the bottom of the copper-pot, where it was diffused pretty completely over its whole surface; and the water falling down into the upper part of the pan of the *adkur*, it thence was conveyed through the square hole, already mentioned, by a trough luted on to it for that purpose, to a cooling receiver a few feet from the furnace; from which they took it up again to supply the upper pot, as occasion required.

As their stock of water, however, in this sort of circulation, was much smaller than it seemingly ought to have been, being scarcely more than six or eight gallons, it too soon became hot; yet, in spite of this disadvantage, that so easily might have been remedied, and the shortness of the conducting tube, which had nothing but the common air to cool it, there ran a stream of liquor from the still; and but very little vapour rising from it; beyond any thing I had ever seen from stills of a much larger size, fitted with a worm and cooler. In about three hours time, indeed, from their lighting of the fire, they drew off full fifteen bottles of spirit; which is more by a great deal, I believe, than could have been done in our way from a still of twice the dimensions.

The convenience of a worm and cooler, which are no small expence either, I have myself often experienced; and if these could be avoided in so simple a way that might easily be improved, the hints that are here offered may be of some use. The thin metal head is certainly well adapted, I think, to transmit the heat to the water, which is constantly renewed; and which, if cold, as it ought to be, must absorb the fastest possible: whereas, in our way, the water being confined  
in

in a tub, that, from the nature of its porous substance, in a great degree rather retains than lets the heats pass away, it soon accumulates in it, and becomes very hot; and, though renewed pretty often, never answers the purpose of cooling the vapour in the worm so expeditiously and effectually, as is done by their more simple and less expensive apparatus. In this country, more especially, where labour and earthen-wares are so cheap, for as many *rupees*, and less, twenty furnaces, with stills, and every thing belonging to them, independent of the copper-pots, might very well be erected, that would yield above a hundred gallons of spirits a day; allowing each still to be worked only twice. So very cheap, indeed, is arrack here, to the great comfort of my miners, and of many thoughtless people beside, that for one single *peysa* (not two farthings sterling) they can get a whole *cutcha-seer* of it in the *bazar*, or above a full *English* pint, and enough to make them completely intoxicated; objects often painful to be seen.

Of the superior excellence of metal in giving out heat from itself, and from vapour contained in it, we have a very clear proof in what is daily performed on the cylinder of the steam engine: for cold water being thrown on it when loaded, the contained vapour is constantly condensed; whence, on a vacuum being thus formed, and the weight of the atmosphere acting on the surface of the piston attached to the arm of the balance, it is made to descend, and to raise the other arm that is fixed to the pump; while this being somewhat heavier, immediately sinks again, which carries up the piston, while the cylinder is again filled; and thus by alternately cooling and filling it, is the machine kept in motion; the power exerted in raising the pump-arm being always in proportion to the diameter of the cylinder, or to the surface of the piston, which is exactly fitted to it, and on which the pressure acts.



The contrivance too, of having the under part of the alembick, where the condensed vapour is collected, or upper part of what they call the *adkur*, of earthen-ware, of so great a thickness, and of course at so great a distance from the heat in the body of the still, is well imagined to keep the spirits the coolest possible, when collected, and running off.

By thus cooling and condensing the vapour, likewise, so suddenly as it rises, there is in a great measure a constant vacuum made, or as much as possibly can be; but, that both steam arises faster, and that water boils with much less heat, when the pressure is taken away from its surface, is an axiom in chemistry too well known to need any illustration; it boiling in vacuum, when the heat is only ninety or ninety-five by Fahrenheit's thermometer; whereas in the open air, under the pressure of the atmosphere, it requires no less than that of two hundred and twelve ere it can be brought to the boiling point.

I must further observe, that the superior excellence of condensing the vapour so effectually and speedily in the alembick, to our method of doing it in a worm and cooler, is greatly on the side of the former; both from the reasons I have already adduced, and because of the small stream of vapour that can be only forced into the worm, where it is condensed gradually as it descends; but, above all, from the nature of vapour itself, with respect to the heat contained in it, which of late has been proved, by the very ingenious Dr. *Black*, to be greater by far than, before his discoveries, was imagined. For vapour he has shewn to be in the state of a new fluid, where water is dissolved by heat; with the assistance, perhaps, if I may be allowed a conjecture, of the air which it contains: and all fluids, as he has clearly demonstrated, on their becoming such, absorb  
a certain

a certain quantity of heat, which becomes what he very properly calls latent heat; it being heat not appearing either to the senses, or to the thermometer, while they remain in that liquid state; but shewing itself immediately by its effects on whatever is near it, upon their changing their form from fluid to solid; as on water becoming ice, or metals fixing, and the like. In the solution of salts, also, there is an absorption of heat, as we daily experience in the cooling of our liquors by dissolving salt-petre in water; and this he has found to be the case with water itself, and other fluids, when passing into a state of vapour by boiling. From the most accurate and judicious experiments, indeed, he infers, and with the greatest appearance of truth, that the heat thus concealed in vapour raised by boiling, from any given bulk of water, would be fully sufficient, if collected in a piece of iron of the like size, to make it perfectly red hot. What then must be the effect of so much heat communicated in our way of distilling to the worm, and to the water in the tub, will be sufficiently evident from what has been said to prove, I think, that we have hitherto employed a worse and more defective method than we might have done with respect to cooling at least, both in the making of spirits, and in other distillations of the like kind, where a similar mode is adopted.

The poor ignorant *Indian*, indeed, while he with wonder surveys the vast apparatus of *European* distillers, in their immense large stills, worms, tubs, and expensive furnaces, and finds that spirits thus made by them are more valued, and sell much dearer than his own, may very naturally conclude, and will have his competitors join with him in opinion, that this must alone surely be owing to their better and more judicious manner of distilling with all those ingenious and expensive contrivances, which he can no ways emulate; but in this, it would appear, they are both equally mistaken;



imputing the effects, which need not be controverted, perhaps, to a cause from which they by no means proceed; the superiority of their spirits not at all arising from the superior excellence of these stills and furnaces, nor from their better mode of conducting the distillation in any respect; but chiefly rather from their greater skill and care in the right choice, and proper management, of the materials they employ in fermentation; and, above all, as I apprehend, from the vast convenience they have in casks, by which, and from their abilities in point of stock, they are enabled, and do, in fact, in general, keep their spirits for a certain time, whence they are mellowed, and improved surprisingly both in taste and salubrity.

With respect to the latter improvement, I mention it more particularly here; and the more willingly also, as in general it seems to have been but too little attended to, where a due attention to it might be of the greatest use. For of all things that have been found grateful to the human palate, there was none ever used, I believe, more hurtful to the body, and to the nerves especially, than fresh drawn ardent spirits; and this owing evidently to the principle of inflammability, of which, with water, they are mostly made up; being then, in a more loose and detached state, less assimilated with the other principles than it afterwards becomes with time. By time, indeed, it is gradually not only more assimilated, but at length changes its nature altogether; so as to become, what was at first so pernicious, a benign, cooling liquor. When the spirit is strong, the change, it is true, goes on more slow and imperceptibly; yet, as a partial alteration is only wanted to mellow it for use, a few years keeping would be sufficient to answer the purpose here; and whether or no it could be possible to prevent any other from being sold than that which had been kept a certain time, is well worth the consideration of the Legislature.

That



That the great noxious quality of fresh drawn spirits is chiefly owing to the cause I have assigned, a little attention, and comparing of the effects that are uniformly produced by the principle of inflammability, wherever it is met with in a loose and weakly combined state, as it is in them, will easily convince us of: whereas, when fully assimilated either in spirits, or with any other body, it becomes entirely inert, and useful, more or less, either for food or physick, according to what it happens to be united with. Thus we find it in putrid animal substances, where it lately formed part of a healthy body, being now detached, or but weakly united with air, exhibiting a most offensive and pernicious poison: though this absorbed again by a living plant, is presently changed into good and wholesome nourishment: to the vegetable immediately, and to any animal who may afterwards choose to eat it. In like manner sulphur, which is a compound of this principle alone, united to a pure acid, the most destructive to all animal and vegetable substances, yet, it being here perfectly inert also, may be taken into the body with safety: when, if loosened either by heat, or by an alkaline salt uniting with the acid, its noxious quality is presently made perceivable to whoever comes within its reach.

Many other instances of a like nature might easily be added, and some too more apposite, perhaps, than those I have here mentioned; but every one's own experience, with what I have already said, will sufficiently evince the propriety and utility of putting an entire stop, if possible, to the sale of what ought to be so justly prohibited: and this, in its consequences, may even help to lead to other more effectual means of correcting, in a great measure, the cruel abuse of spirits in general, that has been long so loudly and so justly complained of amongst the soldiers, lower *Europeans*, and our servants in this country; where the very worst, and, indeed,



deed, poisonous, sort of them is daily sold at so very cheap a rate.

All I need further add with respect to distillation, and on the superior advantages in the mode of conducting it here, to that we have been in use to employ, for the raising of spirits, simple waters, and the like, is only to observe, I have no sort of doubt, but that the intelligent chemical operators at home, if ever they should get a hint of it, will make no manner of scruple to use it also, and to improve upon it greatly by a few ingenious contrivances, which their knowledge and experience will so easily suggest. The principles on which it seems founded, indeed, especially with regard to their way of cooling, are so striking and just, that in many other distillations besides those of spirits and waters, they may be employed, I apprehend, with very great profit and advantage. I shall now, however, confine myself to mention only the benefit that may result from a like process in the raising of the finer aromatics, while the heat contrived, as in our way, besides impeding the distillation, must, from its long action on such subtile bodies, probably injure them greatly in the essential quality on which their excellence depends: and upon this very account I am apt to imagine, that the greater quantity obtained, and the superior quality of the *oil of roses* made in this country, to that made from *roses* with us, is owing chiefly, if not entirely, to their better and more judicious manner of extracting it here. For with us, the still, being made of metal, may, in the first instance, impart too great and too sudden a degree of heat; and next, the *oil* continuing so long in the vapour, and that much compressed, may, in so delicate a subject, not only entirely almost unite it with the water, so as to render the separation impracticable, but may at the same time alter its essence so completely, as that it can no longer appear in the state it otherwise might have been found in, had the operation been bet-  
ter

ter conducted, or in the way they do here. A very few trials, however, would much better certify this, than all I can possibly say on the subject, or, in fact, than all the reasoning in the world. Therefore, as to my own particular opinion of the flavour and quality of the *roses* at home being equal, if not superior, to that of those in this country, I may be entirely silent; the rules and reasoning in chemistry, though serving greatly to enlarge and improve our understanding, being what of themselves can never be depended upon, till confirmed by facts and experiments; where many things often turn out very different from what, from our best and most plausible arguments, we had the greatest reason to expect. Or, if it should be found to be really true, what I have often heard asserted, by those however who had it only from others, but not of their own particular knowledge, that, in distilling their *oil of roses* at the places where they make it the best, they use also with their *roses*, *sandal wood*, and some other aromatics, no *roses* whatsoever, it is plain, could ever of themselves be made to afford a like *oil*; nor without such an addition as they employ. A circumstance, by the bye, that might possibly easily be certified by some one of the many ingenious correspondents of the Society who may happen to reside where it is made: and a knowledge of the real truth of it would certainly be of use.

*Chatra, December 24, 1786.*



## XVI.

## A METHOD OF CALCULATING

THE

## MOON'S PARALLAXES

IN

## LATITUDE AND LONGITUDE.

By Mr. REUBEN BURROW.

IN the Nautical Almanack for 1781, among other Problems published by authority of the Board of Longitude, there is one for calculating the Place of the Nonagesimal Degree; which is expressly recommended to Astronomers as “superior to all other Methods for calculating Eclipses of the Sun, and Occultations of the Stars.” Now, as a considerable part of that method is erroneous, and particularly in South Latitudes, and between the Tropics, (which include the most of *India*,) the error may therefore be of consequence; and the more so, as it is published under the sanction of Dr. *Maskeleyne*, the Astronomer Royal. I have, therefore, taken the liberty of giving the following rule to supply its place; and, in imitation of the methods of the *Hindoos*, have endeavoured to express it so plainly, that any person may calculate by it without knowing much of the subject.

## P R O B L E M.

Given the apparent time at any given place; to find the longitude and altitude of the nonagesimal degree, and also the parallaxes in latitude and longitude.

1. Turn the difference of longitude from *Greenwich* into time, and add it to the apparent time, if the place be to the west

west of *Greenwich*; but subtract if the place be to the east; and the sum, or remainder, will be the apparent time at *Greenwich*.

2. To this time calculate the sun's right ascension in time, and add it to the apparent time at the given place; the sum is the right ascension of the meridian in time.

3. From the latitude of the place by observation, subtract the correction taken from page LXXV of *Mayer's Tables*; the remainder is the latitude in the spheroid.

4. Call the right ascension of the meridian in degrees AR; and, if the right ascension of the meridian be

$$\text{Between } \left\{ \begin{array}{l} 0^\circ \text{ \& } 90^\circ \\ 90^\circ \text{ \& } 270^\circ \\ 270^\circ \text{ \& } 360^\circ \end{array} \right\} \text{ then } \left\{ \begin{array}{l} \text{AR} + 90 \\ 270 - \text{AR} \\ \text{AR} - 270 \end{array} \right\} \text{ is an } \left\{ \begin{array}{l} \text{but} \\ \text{in S.} \\ \text{Lat.} \end{array} \right\} \left\{ \begin{array}{l} 90 - \text{AR} \\ \text{AR} - 90 \\ 450 - \text{AR} \end{array} \right\} \text{ is the } \left\{ \begin{array}{l} \text{Arc} \\ \text{Arc} \\ \text{A.} \end{array} \right\}$$

5. Let half the sum of the colatitude of the place, and the obliquity of the ecliptic, be called C, and half their difference D; then add the secant of C, the cosine of D, and the cotangent of half A, together; the sum (rejecting twice radius) is the tangent of an arc M; then add the cosecant of C, the sine of D, and the cotangent of half A, together; the sum (rejecting twice radius) is the tangent of an arc N; then if the colatitude of the place be greater than the obliquity of the ecliptic, the sum of M and N is an angle, whose complement call B; but if the colatitude be less than the obliquity, let the complement of the difference of M and N be called B.

6. Add



6. Add the secant of B, the sine of A, and the cosine of the latitude of the place, together; the sum (rejecting twice radius) is the sine of the altitude of the nonagesimal degree.

7. Add the tangent of the latitude to the tangent of the obliquity of the ecliptic; the sum is the sine of an angle, which call X.

8. When the right ascension of the meridian is

$$\text{Between } \left\{ \begin{array}{l} 360 - X \& 90 \\ 90 \& 180 + X \\ 180 + X \& 270 \\ 270 \& 360 - X \end{array} \right\} \text{ in N. Lat. } \left\{ \begin{array}{l} \text{or between} \\ X \& 90 \\ 90 \& 180 - X \\ 180 - X \& 270 \\ 270 \& X \end{array} \right\} \text{ in S. Lat. } \left\{ \begin{array}{l} \text{then} \\ B \\ 180 - B \\ 180 + B \\ 360 - B \end{array} \right\} \text{ is the Lon.}$$

of the nonagesimal degree.

9. Add the moon's latitude to  $90^\circ$  when it is of a contrary name to the latitude of the place; but subtract it from  $90^\circ$  when it is of the same name; the sum or remainder is the moon's polar distance. Also take the difference between the moon's longitude and the longitude of the nonagesimal degree, which difference call P: also let half the sum of the moon's polar distance and altitude of the nonagesimal degree be called Q, and half their difference R.

10. Add the secant of Q, the cosine of R, and the cotangent of half P, together; the sum is the tangent of an arc  $m$ : also add the cosecant of Q, the sine of R, and the cotangent of half P together; the sum is the tangent of an arc  $n$ .

11. If

11. If the altitude of the nonagesimal degree be greater than the moon's polar distance, take the sum of the arcs  $m$  and  $n$  for the parallaëtic angle; but if it be less, take their difference.

12. Add the cosecant of the parallaëtic angle, the sine of  $P$ , and the sine of the altitude of the nonagesimal degree, together; the sum (rejecting twice radius) is the sine of the moon's true zenith distance.

13. To the sine of the moon's true zenith distance add the logarithm of the horizontal parallax; the sum (rejecting radius) is the logarithm of the parallax in altitude nearly: add the parallax, thus found, to the true zenith distance, and the sum will be the corrected zenith distance.

14. Add the sine of the corrected zenith distance, the cosine of the parallaëtic angle, and the logarithm of the horizontal parallax, together; the sum (rejecting twice radius) is the logarithm of the parallax in latitude.

15. Add the logarithm of the parallax in latitude, the tangent of the parallaëtic angle, and the secant of the moon's latitude, together; the sum (rejecting twice radius) is the logarithm of the parallax in longitude.

### E X A M P L E.

“What is the altitude and longitude of the nonagesimal degree at Ludlow, whose latitude is  $52^{\circ} 23'$  north, and longitude  $0^{\text{h}}.11^{\text{m}}$ . west of *Greenwich*, 7th February, 1778, at  $10^{\text{h}}.56.11$  app. time, being the time of an occultation of  $\mu$  geminorum?”

Not



Not having the Almanack for 1778, I shall assume the Moon's Latitude to be  $0^{\circ} 51'$  S. and her Longitude  $91^{\circ} 57'$ .

h	'	"		h	'	"	
10	56	11	ap. time	21	27	14	☉ AR
0	11	0	diff. long.	10	56	11	

11	7	11	ap. t. <i>Greenw.</i>	8	23	25	AR of Merid.
----	---	----	-----------------------	---	----	----	--------------

°	'			°	'		
52	23		latitude	125	51	15	=AR
0	14		correction	270			

52	9	reduced lat.	144	8	45	=A
37	51	colat.				

			tang. of latitude	10.11319
18	55	half colat.	tang. of obliq.	9.63761
11	44	half obliq.		

Sine of  $34^{\circ}.18' = X$  9.75080

C = 30 39	secant	10.06535	cosecant	10.29261
D = 7 11	cofine	9.99658	fine	9.09706
$\frac{1}{2}A = 72 4$	cotan.	9.51005	cotang.	9.51005
M = 20 28	tan. M	9.57198	tang. N.	8.89972
N = 4 32				

25 0	A = 144. 9	fin.	9.76765
B = 65 0	Lat. 52. 9	cos.	9.78788
180 0	B 65 0	sec.	10.37405

115 0	long. nonag. deg.	
°	altitude of ditto	58 15 S
45 26	= half ☾'s polar distance	9.92958
29 8	= half alt. non. degree	

Q = 74 34	secant	10.57493	cosec.	10.01595
R = 16 18	cofine	9.98218	fine	9.44819
$\frac{1}{2}P = 11 32$	cotan.	10.69025	cotan.	10.69025
m = 86 46	tan. m	11.24736	tan. n	10.15439
n = 54 58				

parallaetic angle	=31 48	cofecant	10.27823
alt. non. degree	58 15	- fine	9.92958
P	=23 3	- fine	9.59277
<hr/>			
moon's true zen. d.	39 11	- fine	9.80058
horizon. parallax	34 88	- log.	3.54258
<hr/>			
par. in alt. nearly	22 04	- log.	3.34316
Corrected zen. dist.	39 47 44	fine	9.80628
hor par.		log.	3.54258
parallaetic angle		cofine	9.92936
<hr/>			
parallax in latitude	=18 98	log.	3.27822
parallaetic angle	-	tangent	9.79241
moon's latitude	0 51	fecant	10.00023
<hr/>			
parallax in lon.	11 77	- log.	3.07086

When the moon is very near the ecliptic, as in eclipses, the following method will be nearly exact.

1. Add the cofine of the altitude of the nonagesimal degree to the logarithm of the horizontal parallax; the sum (rejecting radius) is the logarithm of the parallax of latitude nearly: add this parallax to the complement of the altitude of the nonagesimal degree, and call the sum the complement of the altitude of the nonagesimal degree corrected.

2. Add the cofecant of the complement of the altitude of the nonagesimal degree, the fine of the complement of the altitude of the nonagesimal degree corrected, and logarithm of the parallax of latitude, nearly together; the



the sum (rejecting twice radius) is the logarithm of the parallax in latitude corrected.

3. Add the logarithm of the parallax in latitude corrected, the sine of P, and the tangent of the altitude of the nonagesimal degree, together ; the sum (rejecting twice radius) is the logarithm of the parallax in longitude.

Scholium. The method of applying the parallaxes usually given, requires no other correction than the following. When the pole of the ecliptic of the same name as the latitude is under the horizon, to the cotangent of the altitude of the nonagesimal degree add the cotangent of the moon's latitude ; the sum is the cosine of an angle ; which added to, and subtracted from, the longitude of nonagesimal degree, give two longitudes, between which the moon's latitude of a contrary name to the elevated pole is to be increased for the apparent latitude ; but beyond those longitudes the moon's true latitude is to be increased by the parallax in latitude to have the apparent latitude.

## R E M A R K S

ON

## ARTIFICIAL HORIZONS, &amp;c.

*By Mr. REUBEN BURROW.*

THE utility of a perfect horizon, and the liability of quicksilver to be disturbed by the least wind, have induced numbers of people to invent artificial horizons of different kinds, and many of them very complicated. Some time ago, having occasion to determine the situation of several places by astronomical observations, and there being no astronomical quadrant belonging to the Company in the settlement, I was under a necessity of determining the latitudes by a sextant, and that at a time when the sun passed so near the zenith as to make it impossible to get meridian altitudes: I therefore collected all the different artificial horizons and glass roofs, and other contrivances for that purpose, I could meet with; but, though they appeared correct, the results were very erroneous. I examined them by bringing the two limbs of the sun, seen by direct vision, to touch apparently in the telescope of a sextant, and then observed the reflected images in quicksilver, which still appeared to touch as before; but, on examining the reflected images in the rest of the artificial horizons, none of them appeared to touch; and the error in many was very considerable. I tried a number of other methods with little success, as they were mostly combinations of glasses. At last, accidentally hearing some officers speaking of "Tents that would neither turn sun or rain," I considered that the rays of the sun would pass through cloth unrefracted; and in consequence



quence of this idea I applied some thin mosquita \* curtain as a covering to the quicksilver, and found it effectually excluded the wind, and admitted the sun; and what is of equal consequence in this country, it totally kept away those minute insects that disturb the surface of the quicksilver in observing. In short, it formed so complete a horizon, that I could not before have hoped for any thing so perfect; and it is equally applicable to the sun and stars.

For taking very great or very small elevations of the sun, (which with the common horizon sextants are impracticable in the direct method,) a polished metalline instrument might be made in the form of part of a hollow obtuse cone: this might have its axis set perpendicular to the horizon at any time *by means of screws* in a variety of methods; and observations might be made by it with great exactness.

In finding the latitude, when meridian observations cannot be taken, either there is an opportunity of taking altitudes on both sides of the meridian, or not. When there is not, the best method is to calculate the latitude from two altitudes, and the time between, exactly by spherical trigonometry, (first correcting the declination to the beginning and end of each interval,) as the approximating methods of *Dowes*, and others, are totally insufficient. When observations can be taken both before and after noon, it is best to take a number of altitudes in both, and then make out the equal altitudes by proportion; then having found the true time of noon by the usual method, correct the two intervals, and the declination to each time, and the latitude may be found as follows.

ADD

\* A kind of silk gauze as close as book-muslin, and perfectly transparent. It is to be stretched over a hoop, which stands without touching the vessel containing the mercury.

*Add the cosine of the angle from noon, to the cotangent of the declination; the sum is the cotangent of an arch A.*

*Add the sine of A, the sine of the altitude, and the arithmetical complement of the sine of the declination, together; the sum is the cosine of an arch B.*

*Then the sum or difference of A and B is the latitude.*

As every single altitude gives an independent latitude, it is evident the latitude may be thus found to great exactness.

An instrument might easily be contrived to measure the sun's angle of position to great exactness, from whence the latitude might readily be deduced; a small addition to the common theodolite would be sufficient. The variation of the azimuth near the meridian may also be advantageously applied for the same purpose.



## DEMONSTRATION

OF A

## THEOREM

*Concerning the INTERSECTIONS of CURVES.*

BY REUBEN BURROW, Esq.

IN *Stone's Mathematical Dictionary* is the following paragraph : “Two geometrical lines of any order, will cut one another in as many points as the number expresses which is produced by the multiplication of the two numbers expressing those orders.” And Mr. *Braikönridge*, in the Preface to his *Exercitatio Geometrica de Descriptione Curvarum*, says, “Mr. George Campbell, now Clerk of the Stores at *Woolwich*, has got a neat demonstration of the same, which I hope he will publish.” As it does not appear that Mr. *Campbell* ever published any thing, except a paper on the roots of equations, and a small treatise on the plagiarisms of *Maclaurin*, it is very probable his demonstration is lost, and therefore it may not be improper to publish the following.

The equation of a line of the first order has one root, or function of the absciss, for the ordinate; of the second order, two; and so on.

In equations for two right lines, the roots may so vary and accommodate themselves to each other, that the quantities expressing the ordinates may be equal; and as there is only one case where this may happen, therefore two right lines can only intersect in one point.

If a line of the first order be compared with a line of the second, or an equation of one root with an equation of two, the root of the first, and a single root of the second,

cond, may so vary as to become equal to each other, or to form an intersection. By the same reason, the single root of the first, and the remaining root of the second, may each so vary as to become equal, or to form another intersection; and therefore a right line cuts a line of the second order in two points.

If a line of the first order be compared with a line of the  $n$  order, it is also evident that the single root of the first line may in the same manner be so varied with each of the  $n$  roots of the second line as to become equal; and therefore a right line may cut a line of the  $n$  order in  $n$  points.

Let a line of the  $m$  order be now compared with a line of the order  $n$ ; then as each single root of the first line may become equal, in the same manner, to every root in the second, it therefore follows, that for every unit in  $m$  there may be  $n$  intersections; and as there are  $m$  units, there consequently will be  $mn$  intersections.

The same method may be applied to the determination of the points, lines, and surfaces, that arise from the intersections of lines, surfaces, and solids; by considering that the number of times that  $p$  may be taken from  $m$ , and  $q$  at the same time from  $n$ , will be

$$\frac{m \cdot m - 1 \dots p, \times n \cdot n - 1 \dots q}{1 \cdot 2 \cdot 3 \dots p, \times 1 \cdot 2 \cdot 3 \dots q}$$



## XVII.

## THE

## PROCESS OF MAKING ATTAR,

## OR

*ESSENTIAL OIL OF ROSES.*

## BY

## LIEUTENANT COLONEL POLIER.

**T**HE *attar* is obtained from the roses by simple distillation, and the following is the mode in which I have made it. A quantity of fresh roses (for example forty pounds) are put in a still with sixty pounds of water, the roses being left as they are with their calyxes, but with the stems cut close. The mass is then well mixed together with the hands, and a gentle fire is made under the still. When the water begins to grow hot, and fumes to rise, the cap of the still is put on, and the pipe fixed: the chinks are then well luted with paste, and cold water put on the refrigeratory at the top. The receiver is also adapted at the end of the pipe; and the fire is continued under the still, neither too violent nor too weak. When the impregnated water begins to come over, and the still is very hot, the fire is lessened by gentle degrees, and the distillation continued till thirty pounds of water are come over, which is generally done in about four or five hours. This rose-water is to be poured again on a fresh quantity (forty pounds) of  
of

of roses ; and from fifteen to twenty pounds of water are to be drawn by distillation, following the same process as before. The rose-water thus made and cohobated, will be found, if the roses were good and fresh, and the distillation carefully performed, highly scented with the roses. It is then poured into pans either of earthen-ware or of tinned metal, and left exposed to the fresh air for the night. The *attar*, or *essence*, will be found in the morning congealed, and swimming on the top of the water. This is to be carefully separated, and collected, either with a thin shell or a skimmer, and poured into a vial. When a certain quantity has thus been obtained, the water and feces must be separated from the clear essence, which, with respect to the first, will not be difficult to do, as the essence congeals with a slight cold, and the water may then be made to run off. If, after that, the essence is kept fluid by heat, the feces will subside, and may be separated; but if the operation has been neatly performed, these will be little or none. The feces are as highly perfumed as the essence, and must be kept after as much of the essence has been skimmed from the rose-water as could be. The remaining water should be used for fresh distillations, instead of common water ; at least as far as it will go.

The above is the whole process of making genuine *attar* of roses. But, as the roses of this country give but a very small quantity of essence, and it is in high esteem, various ways have been thought of to augment the quantity, though at the expence of the quality. In this country it is usual to add to the roses, when put in the still, a quantity of sandal-wood raspings, some more, some less, from one to five *tolahs*, or half ounces. The sandal contains a deal of essential oil, which comes over freely in the common distillation, and mixing with the rose-water and essence, becomes strongly impregnated with their perfume. The imposition, however, cannot be concealed: the essential oil of sandal will not congeal in common cold; and its smell cannot be kept under,  
but



but will be apparent and predominate, in spite of every art. In *Cashemire* they seldom use sandal to adulterate the *attar*; but I have been informed, to increase the quantity, they distil with the roses a sweet-scented grass, which does not communicate any unpleasant scent, and gives the *attar* a high clear green colour. This essence also does not congeal in a slight cold, as that of roses.

Many other ways of adulteration have been practised, but all so gross and palpable, that I shall say nothing of them.

The quantity of essential oil to be obtained from the roses is very precarious and uncertain, as it depends not only on the skill of the distiller, but also on the quality of the roses, and the favourableness of the season. Even in Europe, where the chemists are so perfect in their business, some, as *Tachenius*, obtained only half an ounce of oil from one hundred pounds of roses. *Hamburg* obtained one ounce from the same quantity; and *Hoffman* above two ounces. (N. B. The roses in those instances were stripped of their calyxes, and only the leaves used.) In this country nothing like either can be had; and to obtain four *mashtas* (about one drachm and a half) from eighty pounds, which, deducting the calyxes, comes to something less than three drachms per hundred pounds of rose-leaves, the season must be very favourable, and the operation carefully performed.

In the present year, 1787, I had only sixteen *tolahs* of *attar* from fifty-four *maunds*, twenty-three *seers*, of roses, produced from a field of thirty-three *biggahs*, or eleven *English* acres; which comes to about two drachms per 100 pounds. The colour of the *attar* of roses is no criterion of its goodness, quality, or country. I have had, this year, *attar* of a fine emerald green, of a bright yellow, and of a reddish hue, from the same ground, and obtained by the same process, only of roses collected on different days.

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The calyxes do not in any shape diminish the quality of the *attar*, nor impart any green colour to it; though perhaps they may augment the quantity; but the trouble necessary to strip them must, and ought, to prevent its being ever put in practice.

*Lucknow, May, 1787.*



BY

MR. MACDONALD,

WITH

## A SPECIMEN OF GOLD.

THE country of *Limong*, on the Island of *Sumatra*, immediately contiguous to the Presidency of *Fort Marlborough*, and between seventy and eighty miles inland, produces the finest gold and gold-dust on that island. The *Limong* gold merchants repair annually to *Marlborough* for the purchase of *opium*, and such other articles as they may be in want of; in exchange for which they give gold of so pure a nature as to contain little or no alloy. The gold is found sometimes in dust, and often lodged in a very hard stone. It is of a whitish colour, and resembles that in which the veins run in the gold mines of *Tiltil* in *Chili*. The gold is extracted by beating the compound mass in order to disengage it from the stone, which flies off in splinters, and leaves the gold cleared of it. This is the mode used by a rude people; by which a part of the gold must be lost in the splinters of the stone which fly off in beating the mass. They are totally ignorant of the advantage of grinding it to a gross powder, mixing it with quicksilver, and separating the earthy and stony particles from those of the gold, by the action of a stream of water on this paste, carrying off the former, and leaving the latter precipitated to the bottom by their greater weight. They are almost entirely ignorant of the principles of assaying and amalgamation, but are extremely expert in separating particles of foreign metals from gold-dust, by a very superior acuteness of vision, no doubt arising from experience, and not a peculiar gift. They have people among them who are gold-cleaners

cleaners by occupation. The gold is found in a species of earth composed of a clayish-red-loam. On digging the earth, it is found to consist of strata (under the loam of the surface, commonly called soil) of irregular shaped stones of a mouldering nature, mixed with a red clay, and hard pebbles mixed with a pale red clay, of a more dense consistency than that of the first stratum. The first stratum extends to a depth of three feet and a half, and the second to somewhat less. The consistency under these strata is formed of either hard rock, or of gravel nearly approaching to it. The gold is found mixed with a stone of a hard nature, and capable of sustaining a polish. It is found near the surface, and generally in a soil free from solid rock.

The merchants, who bring the gold for sale, are not themselves the finders or gatherers of it, but receive it, for merchandise, from the *Malays* inhabiting the interior parts of the country. The native indolence of the *Malay* disposition prevents them from collecting more than is sufficient to supply the few and simple wants of a race of men as yet unenlightened by civilization and science, and ignorant of the full extent of the advantages of the country inhabited by them. We have not, to this hour, explored a country, which, we have reason to suppose, produces more, or as much, gold as either *Peru* or *Mexico*. This may be attributed partly to the difficulties incident to the undertaking, and partly to a want of curiosity, that, indulged, might have been productive of great national and private advantages. The roads leading to this golden country are almost impervious, affording only a scanty path to a single traveller, where whole nights must be passed in the open air, exposed to the malignant influence of a hostile climate, in a country infested by the most ferocious wild beasts. These are circumstances that have hitherto checked curiosity; but perseverance, and contrived precaution, will surmount the obstacles they furnish; and such



such discoveries might be made, as would amply compensate for the difficulties leading to them. The gold-merchants who come from the neighbouring and less rich countries, give us such accounts of the facility of procuring gold as border nearly on the marvellous, and would be altogether incredible, if the great quantities of that metal produced by them, did not, in a great measure, evince the certainty of their accounts. I have seen an imperfect chart of a part of the interior country, made by an intelligent native, on the scale of the rate of his walking, and from the respective situations of the sun in regard to his position. It contained a chain of what he called Gold Mines, extending in latitude, nearly, not much less than three degrees. This chart is in the possession of Mr. Miller, of the Council of *Fort Marlborough*, who did me the favour of explaining it. After making allowances for the license of a traveller, some credit may be given to this chart, more especially, as we are well assured that that part of *Sumatra* produces large quantities of fine gold. The result of the whole is, that it would be a very laudable object to explore those rich countries, and to establish the working of gold-mines in them, as it could be done under a certain prospect of advantage. The expence arising from clearing the country, procuring intelligence, making roads, establishing and forming posts of communication, and of employing professional men, would, undoubtedly, be at first very considerable, but the resulting advantages would defray these, and render it a matter of surprise, that a measure attended with such obvious utility had not been adopted at an earlier period.

It is more than probable that *Sumatra* must have been the *Ophir* of *Solomon's* time. This conjecture derives no small force from the word *ophir* being really a *Malay* substantive of a compound sense, signifying, *a mountain containing gold*. The natives have no oral or written tradition on the subject, excepting that the island has in former times afforded gold for exportation; whether to the

the eastward or westward, remains an uncertainty. We have certain accounts that the vessels that imported this article were long detained, or did not return in much less than a year. It is therefore probable that they wintered, during the violence of the SW. monsoon, either at *Ceylon*, or on the north-east coast, and completed their voyages during the moderate part of the other monsoon.



## XVIII.

ON THE

Literature of the Hindus, from the Sanscrit,

COMMUNICATED BY

GOVERDHAN CAUL,

*With a short Commentary.*

## THE TEXT.

THERE are eighteen *Vidyâ's*, or Parts of *true Knowledge*, and some branches of knowledge *falsely so called*, of both which a short account shall here be exhibited.

The first *four* are the immortal *Vêda's*, evidently revealed by God ; which are entitled, in one compound word, *Rigyajuhśâmât'harva*, or, in separate words, *Rich*, *Yajush*, *Sáman*, and *At'harvan*. The *Rigvêda* consists of *five* sections ; the *Yajurvêda*, of *eighty-six* ; the *Sámanavêda*, of a *thousand* ; and the *At'harvavêda*, of *nine* ; with eleven hundred *śác'ha's*, or branches, in various divisions and subdivisions. The *Vêda's*, in truth, are infinite ; but were reduced by *Vyása* to this number and order : the principal part of them is that which explains the duties of man in a methodical arrangement ; and in the *fourth* is a system of divine ordinances.

From these are deduced the four *Upavêdas*, namely, *Ayush*, *Gándharva*, *Dhanush*, and *St'hápatya* ; the first of which, or *Ayurvêda*, was delivered to mankind by *Brahmá*, *Indra*, *Dhanwantari*, and *five* other Deities ; and comprises the theory of disorders and medicines, with the practical methods of curing diseases. The second, or musick, was invented and explained by *Bharata* : it is chiefly useful in raising the mind by devotion

devotion to the felicity of the Divine Nature. The third *Upavéda* was composed by *Viśwamitra*, on the fabrication and use of arms and implements handled in war by the tribe of *Cshatriya*'s. *Viśwacarman* revealed the fourth in various treatises on sixty-four mechanical arts, for the improvement of such as exercise them.

Six *Anga*'s, or *bodies of learning*, are also derived from the same source: their names are, *Sicshà*, *Calpa*, *Vyácarana*, *Ch'handas*, *Jyótith*, and *Niručti*. The first was written by *Pánini*, an inspired saint, on the pronunciation of vocal sounds; the second contains a detail of religious acts and ceremonies from the first to the last; and from the branches of these works a variety of rules have been framed by *Aśwaláyana*, and others. The third, or the grammar, entitled *Pániniya*, consisting of eight lectures, or chapters, (*Vridddhirádaij*, and so forth,) was the production of the three *Rishi*'s, or holy men, and teaches the proper discriminations of words in construction; but other less abstruse grammars, compiled merely for popular use, are not considered as *Anga*'s. The fourth, or *profody*, was taught by a *Muni*, named *Pingala*, and treats of charms and incantations, in verses aptly framed, and variously measured; such as the *Gáyatri*, and a thousand others. *Astronomy* is the fifth of the *Védānga*'s, as it was delivered by *Súrya*, and other divine persons: it is necessary in calculations of time. The sixth, or *Niručti*, was composed by *Yásca*, (so is the manuscript; but perhaps, it should be *Vyása*,) on the signification of difficult words and phrases in the *Véda*'s.

Lastly, there are four *Upānga*'s, called *Purāna*, *Nyāya*, *Mīmāṃsà*, and *Dherma śāstra*. Eighteen *Purāna*'s (that of *Brahmā* and the rest) were composed by *Vyása* for the instruction and entertainment of mankind in general.

*Nyāya*



*Nyāya* is derived from the root *ní*, to *acquire or apprehend*; and, in this sense, the books on *apprehension, reasoning, and judgment*, are called *Nyāya*. The principal of these are the work of *Gautama*, in *five* chapters; and that of *Canāda*, in *ten*: both teaching the meaning of sacred texts, the difference between just and unjust, right and wrong, and the principles of knowledge, all arranged under *twenty-three* heads. *Mīmāṃsā* is also *two-fold*; both shewing what acts are pure or impure, what objects are to be desired or avoided, and by what means the soul may ascend to the First Principle. The *former*, or *Carma Mīmāṃsā*, comprised in twelve chapters, was written by *Jaimini*, and discusses questions of moral duties and law. Next follows the *Upāśanā Cānda*, in four lectures, (*Sancarsana* and the rest,) containing a survey of religious duties; to which part belong the rules of *Sāṅdilya*, and others, on devotion, and duty to God. Such are the contents of the *Pūrva*, or *former*, *Mīmāṃsā*. The *Uttara*, or *latter*, abounding in questions on the Divine Nature, and other sublime speculations, was composed by *Vyāsa*, in *four* chapters and *sixteen* sections: it may be considered as the brain and spring of all the *Anga's*; it exposes the heretical opinions of *Rāmānuja*, *Mādhwa*, *Vallabha*, and other sophists; and, in a manner suited to the comprehension of adepts, it treats on the true nature of *Ganēsa*, *Bhāscara*, or the Sun, *Nílacanta*, *Lacshmí*, and other forms of One Divine Being. A similar work was written by *Srísancara*, demonstrating the supreme power, goodness and eternity of God.

The Body of *Law*, called *Smṛiti*, consists of *eighteen* books, each divided under three general heads, the duties of *religion*, the administration of *justice*, and the punishment or *expiation* of crimes. They were delivered, for the instruction of the human species, by *Menu*, and other sacred personages.

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As to *Ethicks*, the *Véda's* contain all that relates to the duties of kings; the *Purána's*, what belongs to the relation of husband and wife; and the duties of friendship and society (which complete the triple division) are taught succinctly in both: this double division of *Anga's* and *Upánga's*, may be considered as denoting the double benefit arising from them in *theory* and *practice*.

The *Bhárata* and *Rámáyana*, which are both epick poems, comprise the most valuable part of ancient history.

For the information of the lower classes in religious knowledge, the *Pásúpata*, the *Pancharátra*, and other works, fit for nightly meditation, were composed by *Siva*, and others, in a hundred and ninety-two parts, on different subjects.

What follow are not really divine, but contain infinite contradictions. *Sánc'hya* is twofold; that with *Íswara*, and that without *Íswara*. The former is entitled *Pátanjala*, in one chapter of four sections, and is useful in removing doubts by pious contemplation: the second, or *Cápila*, is in six chapters, on the production of all things by the union of *Pracriti*, or *nature*, and *Purusha*, or the *first male*: it comprises also, in eight parts, rules for devotion, thoughts on the invifible power, and other topicks. Both these works contain a studied and accurate *enumeration* of natural bodies and their principles; whence this philosophy is named *Sánc'hya*. Others hold, that it was so called from its *reckoning three sorts of pain*.



The *Mīmāṃsā*, therefore, is in *two* parts, the *Nyāya* in *two*, and the *Sānc'hya* in *two* ; and these *six* schools comprehend all the doctrine of the theists.

Last of all appears a work written by *Buddha* : and there are also *six* atheistical systems of philosophy, entitled *Yógāchāra*, *Saudhānta*, *Vaibhāshica*, *Mādhyamica*, *Digambara*, and *Chārvāc* ; all full of indeterminate phrases, errors in sense, confusion between distinct qualities, incomprehensible notions, opinions not duly weighed, tenets destructive of natural equality, containing a jumble of atheism and ethicks ; distributed, like our orthodox books, into a number of sections, which omit what ought to be expressed, and express what ought to be omitted ; abounding in false propositions, idle propositions, impertinent propositions. Some assert, that the heterodox schools have no *Upāṅga*'s ; others, that they have *six* *Anga*'s, and as many *Sāṅga*'s, or *Bodies*, and other *Appendices*.

Such is the analysis of universal knowledge, *practical* and *speculative*.

## THE COMMENTARY.

The first chapter of a rare *Sanscrit* Book, entitled *Vidyāderśa*, or a *View of Learning*, is written in so close and concise a style, that some parts of it are very obscure, and the whole requires an explanation. From the beginning of it we learn that the *Vēda*'s are considered by the *Hindus* as the fountain of all knowledge, human and divine ; whence the verses of them are said  
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in the *Gílà* to be the *leaves* of that holy tree, to which the Almighty himself is compared :

[yam

*úrdhwa mûlam adhah śác'ham aśwatt'ham práhuravya-  
ch'handánsi yasya pernâni yastam véda sa védavit.*

“ The wise have called the Incorruptible One an *Aś-*  
“ *watt'ha*, with its roots above and its branches below ;  
“ the leaves of which are the sacred measures. He  
“ who knows this tree knows the *Véda's*.”

All the *Pandits* insist that *Aśwatt'ha* means the *Pip-  
pala*, or *religious fig tree*, with heart-shaped, pointed,  
and tremulous leaves ; but the comparison of heavenly  
knowledge, descending and taking root on earth, to the  
*Vatā*, or *great Indian fig-tree*, which has most conspi-  
cuously its roots on high, or at least has radicating  
branches, would have been far more exact and striking.

The *Véda's* consist of three *Cánda's*, or *General Heads* ;  
namely, *Carma*, *Jñyāna*, *Upāsana* ; or *Works*, *Faith*, and  
*Worship* : to the first of which the author of the *Vidyā-  
dersa* wisely gives the preference, as *Menu* himself pre-  
fers *universal benevolence* to the *ceremonies* of religion :

*Japyénaiva tu sanśiddhyèdbráhmaṇó nátra sanśayah :*  
*Curyádanyatravá curyánmaitrá bráhmaṇa uchyaṭè.*

That is, “ By silent adoration undoubtedly a *Bráh-*  
“ *man* attains holiness ; but every *benevolent man*, whe-  
“ ther he perform or omit that ceremony, is justly  
VOL. I. B b “ styled



“ styled a *Bráhma*n.” This triple division of the *Véda*’s may seem at first to throw light on a very obscure line in the *Gítà* :

*Traigunya*viśhayaḥ *védà* niśtraigunya *bhavárjuna* :

Or, “ The *Véda*’s are attended with three qualities :  
“ be not thou a man of *three* qualities, O, *Arjuna* !”

But several *Pandits* are of opinion, that the phrase must relate to the three *Guna*’s, or *qualities* of the mind ; that of *excellence*, that of *passion*, and that of *darkness* ; from the last of which a hero should be wholly exempt ; though examples of it occur in the *Véda*’s, where animals are ordered to be *sacrificed*, and where horrid incantations are inserted for the *destruction* of enemies.

It is extremely singular, as Mr. *Wilkins* has already observed, that, notwithstanding the fable of *Bráhma*’s *four* mouths, each of which uttered a *Véda*, yet most ancient writers mention only *three Véda*’s, in the order as they occur in the compound word *Rigyajuhśama* ; whence it is inferred, that the *At’harvan* was written or collected after the three first ; and the two following arguments, which are entirely new, will strongly confirm this inference. In the eleventh book of *Menu*, a work ascribed to the *first* age of mankind, and certainly of high antiquity, the *At’harvan* is mentioned by name, and styled the *Véda* of *Véda*’s ; a phrase which countenances the notion of *Dárā Shecúh*, who asserts, in the preface to his *Upa-niṣhat*, that “ the *three* first *Véda*’s are named separately, “ because the *At’harvan* is a corollary from them all, and “ contains the quintessence of them.” But this verse of *Menu*, which occurs in a modern copy of the work

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brought from *Bánáres*, and which would support the antiquity and excellence of the *fourth Véda*, is entirely omitted in the best copies, and particularly in a very fine one written at *Gayá*, where it was accurately collated by a learned *Bráhma*n; so that, as *Menu* himself, in other places, names only three *Véda*'s, we must believe this line to be an interpolation by some admirer of the *At'harvan*: and such an artifice overthrows the very doctrine which it was intended to sustain.

The next argument is yet stronger, since it arises from *internal* evidence; and of this we are now enabled to judge by the noble zeal of Colonel *Polier* in collecting *Indian* curiosities; which has been so judiciously applied, and so happily exerted, that he now possesses a complete copy of the *four Véda*'s in eleven large volumes.

On a cursory inspection of those books it appears, that even a learner of *Sanscrit* may read a considerable part of the *At'harvavéda* without a dictionary; but that the style of the other *three* is so obsolete, as to seem almost a different dialect. When we are informed, therefore, but that a few *Bráhmans* at *Bánáres* can understand any part of the *Véda*'s, we must presume, that none are meant, but the *Rich*, *Yajush*, and *Sáman*, with an exception of the *At'harvan*, the language of which is comparatively modern; as the learned will perceive from the following specimen:

*Yatra brahma vidò yānti dīśhaya tāpasā sahā agnirmān.  
tatra nayatwagnirmédhān dedhātumē, agnayē swāhā.  
vāyurmān tatra nayatu vāyuh prāhān dedhātu mē, vā-  
yuwē swāhā, sūryò mān tatra nayatu chachshuh sūryò  
dedhātu mē, sūryāya swāhā; chandró mān tatra nayatu  
manaschandrò dedhātu mē, chandrāya swāhā. sómò*



*mān tatra nayatu payah sómò dedhātu mé, fómáya swáhà. Indrò mān tatra nayatu balamindrò dedhātu mé, indráya swáhà. ápò mān tatra nayatwámritammópatishtatu, adbhayah swáhà. yatra brahmavidò yánti dícshayà tapasà saha, brahmà mān tatra nayatu brahma brahmà dedhātu me, brahmanè swáhà.*

That is, “Where they, who know the Great One, go  
 “through holy rites, and through piety, thither may fire  
 “raise me! May fire receive my sacrifices! Myste-  
 “rious praise to fire! May air waft me thither! May  
 “air increase my spirits! Mysterious praise to air!  
 “May the Sun draw me thither! May the sun enlighten  
 “my eye! Mysterious praise to the sun! May the  
 “Moon bear me thither! May the moon receive my  
 “mind! Mysterious praise to the moon! May the  
 “plant *Sóma* lead me thither! May *Sóma* bestow on  
 “me its hallowed milk! Mysterious praise to *Sóma*!  
 “May *Indra*, or the *firmament*, carry me thither! May  
 “*Indra* give me strength! Mysterious praise to *Indra*!  
 “May *water* bear me thither! May water bring me  
 “the stream of immortality! Mysterious praise to the  
 “waters! Where they, who know the Great One, go,  
 “through holy rites, and through piety, thither may  
 “*Brahmá* conduct me! May *Brahmá* lead me to the  
 “Great One! Mysterious praise to *Brahmá*!”

Several other passages might have been cited from the first book of the *At'harvan*, particularly a tremendous *incantation* with consecrated *grasses*, called *Darbbha*, and a sublime hymn to *Cála*, or Time; but a single passage will suffice to show the style and language of this extraordinary work. It would not be so easy to produce a genuine extract from the other *Véda's*. Indeed, in a book, entitled *Sivavédánta*, written in *Sanscrit*, but in *Cáshmirian* letters, a stanza from the *Yajurvéda*, is introduced, which deserves, for its sublimity, to be quoted here ;

here ; though the regular cadence of the verses, and the polished elegance of the language, cannot but induce a suspicion, that it is a more modern paraphrase of some text in the ancient scripture :

*nataatra sūryò bhāti nacha chandra tāraca, nēma vi-  
dyutó bhānti cuta éva vāhnih : tamēva bhāntam anub-  
hāti servam, tasya bhāśa servamidam vibhāti.*

That is, “ There the sun shines not, nor the moon and  
“ stars. These lightnings flash not *in that place* : how  
“ should even fire blaze *there* ? God irradiates all this  
“ bright substance ; and by its effulgence the universe  
“ is enlightened.”

After all, the books on *Divine Knowledge*, called *Vēda*, or what is *known*, and *Sruti*, or what has been *heard*, from revelation, are still supposed to be very numerous ; and the *four* here mentioned are thought to have been selected as containing all the information necessary for man. *Mohsani Fānī*, the very candid and ingenious author of the *Dabistān*, describes in his first chapter a race of old *Persian* sages, who appear from the whole of his account to have been *Hindus* : and we cannot doubt that the book of *Mahābād*, or *Menu*, which was written, he says, *in a celestial dialect*, means the *Vēda* ; so that, as *Zerātusht* was only a reformer, we find in *India* the true source of the ancient *Persian* religion. To this head belong the numerous *Tantrā*, *Mantra*, *Agama*, and *Nigama*, *Sāstra*’s which consist of *incantations* and other texts of the *Vēda*’s, with remarks on the occasions on which they may be successfully applied. It must not be omitted, that the *Commentaries* on the *Hindu Scriptures*, among which that of *Vasishtha* seems to be reputed the most excellent, are innumerable ; but, while we have

access



access to the fountains, we need not waste our time in tracing the rivulets.

From the *Védas* are immediately deduced the practical arts of *Chirurgery* and *Medicine*, *Musick*, and *Dancing*; *Archery*, which comprises the whole art of war; and *Architecture*, under which the system of *Mechanical Arts* is included. According to the *Pandits*, who instructed *Abu'lfazl*, each of the four Scriptures gave rise to one of the *Upavéda's*, or *Sub-scriptures*, in the order in which they have been mentioned; but this exactness of analogy seems to favour of refinement.

Infinite advantage may be derived by *Europeans* from the various *Medical* books in *Sanscrit*, which contain the names and descriptions of *Indian* plants and minerals, with their uses, discovered by experience in curing disorders. There is a vast collection of them from the *Cheraca*, which is considered as a work of *Siva*, to the *Róganirúpana* and the *Nidána*, which are comparatively modern. A number of books, in prose and verse, have been written on *Musick*, with specimens of *Hindu* airs in a very elegant notation; but the *Silpa śāstra*, or Body of Treatises on *Mechanical Arts*, is believed to be lost.

Next in order to these are the six *Védānga's*, three of which belong to *Grammar*. One relates to religious Ceremonies; a fifth, to the whole compass of *Mathematicks*, in which the author of *Lílāwatí* was esteemed the most skilful man of his time; and the sixth, to the explanation of obscure words or phrases in the *Védas*. The grammatical work of *Pánini*, a writer supposed to have been inspired, is entitled *Siddhānta Caumudī*, and is so abstruse as to require the lucubrations of many years

years before it can be perfectly understood. When *Ēśínát'ha Serman*, who attended Mr. *Wilkins*, was asked what he thought of the *Páhiníya*, he answered very expressively, that "it was a forest;" but, since grammar is only an instrument, not the end, of true knowledge, there can be little occasion to travel over so rough and gloomy a path; which contains, however, probably, some acute speculations in *Metaphysics*. The *Sanscrit* Prosody is easy and beautiful; the learned will find in it almost all the measures of the *Greeks*; and it is remarkable, that the language of the *Bráhmans* runs very naturally into *Sapphicks*, *Alcaicks*, and *Iambicks*. Astronomical works in this language are exceedingly numerous; seventy-nine of them are specified in one list; and if they contain the names of the principal stars visible in *India*, with observations on their positions in different ages, what discoveries may be made in science, and what certainty attained in ancient chronology!

Subordinate to these *Anga's* (though the reason of the arrangement is not obvious) are the series of *Sacred Poems*, the *Body of Law*, and the *six Philosophical śástras*, which the author of our text reduces to *two*, each consisting of *two* parts; and rejects a *third*, in *two* parts also, as not perfectly *orthodox*: that is, not strictly conformable to his own principles.

The first *Indian* Poet was *Válmíci*, author of the *Rámáyana*, a complete epic poem on one continued, interesting, and heroick action: and the next in celebrity, if it be not superior in reputation for holiness, was the *Mahábhárata* of *Vyása*. To him are ascribed the sacred *Purána's*, which are called, for their excellence, the *Eighteen*, and which have the following titles: *Brahme*, or the *Great One*; *Pedma*, or the *Lotos*; *Bráhmánda*, or the *Mundane Egg*; and *Agni*, or *Fire*; (these four relate to  
the



the *Creation*;) *Viṣṇu*, or the *Pervader*: *Garuḍa*, or his *Eagle*; the Transformations of *Brahmā*, *Siva*, *Linga*; *Nāreda*, son of *Brahmā*; *Scanda*, son of *Siva*; *Marcanḍeya*, or the Immortal Man; and *Bhawishya*, or the *Prediction of Futurity*; (these nine belong to the attributes and powers of the Deity;) and four others, *Matṣya*, *Varāha*, *Cūrma*, *Vāmena*, or as many incarnations of the Great One in his character of *Preserver*; all containing ancient traditions, embellished by poetry, or disguised by fable. The *eighteenth* is the *Bhāgawata*, or *Life of Crishna*, with which the same Poet is by some imagined to have crowned the whole series; though others, with more reason, assign them different composers.

The system of *Hindu* law, besides the fine work called *Menuṣmṛiti*, “or what is remembered from *Menu*,” that of *Yājñyavalkya*, and those of sixteen other *Muni*’s, with *Commentaries* on them all, consists of many tracts in high estimation, among which those current in *Bengal* are an excellent *Treatise on Inheritances*, by *Jīmūta Vāhana*; and a complete *Digest*, in twenty-seven volumes, compiled a few centuries ago by *Raghunandan*, the *Tribonian of India*, whose work is the grand repository of all that can be known on a subject so curious in itself, and so interesting to the *British Government*.

Of the Philosophical Schools it will be sufficient here to remark, that the first *Nyāya* seems analagous to the *Peripatetick*; the second, sometimes called *Vaiśiṣhika*, to the *Ionick*; the two *Mimāṃsā*’s, of which the second is often distinguished by the name of *Védānta*, to the *Platonick*: the first *Sāṅc’hya* to the *Italick*; and the second, or *Pātanjala*, to the *Stoick*, Philosophy; so that *Gautama* corresponds with *Aristotle*, *Canāda* with *Thales*, *Jaimini* with *Socrates*, *Vyāsa* with *Plato*, *Capila* with

with *Pythagoras*, and *Patanjali* with *Zeno* : but an accurate comparison between the *Grecian* and *Indian* Schools would require a considerable volume. The original works of those Philosophers are very succinct ; but, like all the other *Sástras*, they are explained, or obscured, by the *Upaderšana*, or *Commentaries*, without end. One of the finest compositions on the Philosophy of the *Védánta* is entitled *Yóga Vásisht'ha*, and contains the instructions of the great *Vasistha* to his pupil, *Ráma*, king of *Ayódhya*.

It results from this analysis of *Hindu* Literature, that the *Véda*, *Upavéda*, *Védānga*, *Purána*, *Dherma*, and *Deršana*, are the *Six* great *Sástras*, in which all knowledge, divine and human, is supposed to be comprehended. And here we must not forget, that the word *Sástra*, derived from a root signifying *to ordain*, means generally an *ordinance*, and particularly a *sacred ordinance*, delivered by inspiration. Properly, therefore, this word is applied only to *sacred literature*, of which the text exhibits an accurate sketch.

The *Súdra*'s, or *fourth* class of *Hindus*, are not permitted to study the *six* proper *Sástra*'s before enumerated ; but an ample field remains for them in the study of *profane literature*, comprised in a multitude of *popular* books, which correspond with the several *Sástra*'s, and abound with beauties of every kind. All the tracts on *Medicine* must, indeed, be studied by the *Vaidya*'s, or those who are born physicians ; and they have often more learning, with far less pride, than any of the *Bráhmans*. They are usually poets, grammarians, rhetoricians, moralists ; and may be esteemed in general the most virtuous and amiable of the *Hindus*. Instead of the *Véda*'s, they study the *Rájaníti*, or *Instruction of Princes* ; and, instead of *Law*, the *Nítisástra*, or general System of *Ethicks*. Their *Sahitia*, or *Cávya Sástra*, consists of innumerable poems, written chiefly by the *medical* tribe, and supplying the place of the *Purána*'s, since they



they contain all the stories of the *Rámáyana*, *Bhárata*, and *Bhágawata*. They have access to many treatises of *Alancára*, or Rhetorick, with a variety of works in modulated Prose. To *Upác'hyána*, or Civil History, called also *Rájatarangini*; to the *Nátaca*, which answers to the *Gándharvavéda*, consisting of regular *Dramatick* pieces in *Sanfrit* and *Prácrit*: besides which, they commonly get by heart some entire dictionary and grammar. The best lexicon or vocabulary was composed in verse, for the assistance of the memory, by the illustrious *Amarasinha*; but there are *seventeen* others in great repute. The best grammar is the *Mugdhabódha*, or the *Beauty of Knowledge*, written by a *Góswámi*, named *Vópadéva*, and comprehending, in two hundred short pages, all that a learner of the language can have occasion to know. To the *Cósha*'s, or dictionaries, are usually annexed very ample *Ticá*'s, or *Etymological Commentaries*.

We need say no more of the heterodox writings, than that those on the religion and philosophy of *Buddha*, seem to be connected with some of the most curious parts of *Asiatick* History, and contain, perhaps, all that could be found in the *Páli*, or *sacred language*, of the Eastern Indian Peninsula. It is asserted in *Bengal*, that *Amarasinha* himself was a *Baudha*; but he seems to have been a theist of tolerant principles, and, like *Abu'lfazl*, desirous of reconciling the different religions of *India*.

Wherever we direct our attention to *Hindu* Literature, the notion of *infinity* presents itself; and the longest life would not be sufficient for the perusal of near five hundred thousand stanzas in the *Purána*'s, with a million more perhaps in the other works before mentioned. We may, however, select the best from each *Sástra*, and gather the fruits of science, without loading ourselves with the leaves and branches; while we have the pleasure

pleasure to find, that the learned *Hindus*, encouraged by the mildness of our government and manners, are at least as eager to communicate their knowledge of all kinds as we can be to receive it. Since *Europeans* are indebted to the *Dutch* for almost all they know of *Arabick*, and to the *French* for all they know of *Chiniese*, let them now receive from our nation the first accurate knowledge of *Sanscrit*, and of the valuable works composed in it. But, if they wish to form a correct idea of *Indian* religion and literature, let them begin with forgetting all that has been written on the subject, by ancients or moderns, before the publication of the *Gîtâ*.



*To the PRESIDENT.*

MY DEAR SIR,

I HEREWITH fend you six ancient Copper-Plates, fastened together by a Ring in two Parcels, each containing Three. They were found in digging for some new Works at the Fort of *Tanna*, the Capital of *Salset*. The Governor of *Bombay* informed me, none of the *Gujerat Brahmins* could explain the Inscriptions. I obtained Permissiion to bring them round with me, being desirous of submitting them to the investigation of the *Asiatick Society*, under the Promise of restoring them to the Proprietor.

I have the honour to be with great Respect,

Dear SIR WILLIAM,

Your most faithful humble Servant,

J. CARNAC.

*February 15th, 1787.*





[illegible]



XIX.

AN INDIAN GRANT OF LAND

IN Y. C. 1018.

*Literally Translated from the Sanscrit,*

AS EXPLAINED BY RA'MALO'CHAN PANDIT.

COMMUNICATED BY

GENERAL CARNAC.

O'M. VICTORY and ELEVATION !

STANZAS.

MAY He, who in all affairs claims precedence in adoration ; may that *Gan anâyaca*, averting calamity, preserve you from danger !

2. May that *Siva* constantly preserve you, on whose head shines (*Gangá*) the daughter of *Jahnu*, resembling the-pure-crescent-rising-from-the-summit-of-*Suméru* !  
(*A compound word of sixteen syllables.*)

3. May that God, the cause of success, the cause of felicity, who keeps, placed even by himself on his forehead a section of the-moon-with-cool-beams, drawn-in-the-form-of-a-line-resembling-that-in-the-infinitely-bright-spike-of-a-fresh-blown-*Cétaca* (who is) adorned-with-a-grove-of-thick-red-locks-tied-with-the-Prince-of-Serpents, be always present and favourable to you !

4. The



4. The son of *Jímútacétu*, ever affectionate, named *Jímútaváhana*, who, surely, preserved (the Serpent) *śanc'hachúda* from *Garúda*, (*the Eagle of Vishnu*,) was famed in the three worlds, having neglected his own body, as if it had been grass, for the sake of others.

5. (*Two couplets in rhyme.*) In his family was a monarch (*named*) *Capardin*, (*or, with thick hair, a title of Mahádéva,*) chief of the race of *Sílāra*, repressing the insolence of his foes: and from him came a son, named *Pulasaēti*, equal in increasing glory to the sun's bright circle.

6. When that son of *Capardin* was a new-born infant, through fear of him, homage was paid by all his collected enemies, with water held aloft in their hand, to the delight of his realm.

7. From him came a son, the only warrior on earth, named *Srívappuvanna*, a hero in the theatre of battle.

8. His son, called *Srī Jhanjha*, was highly celebrated, and the preserver of his country. He afterwards became the Sovereign of *Gógni*: he had a beautiful form.

8. From him *came* a son, whose-renown was-far-extended-and-who-confounded-the-mind-with-his-wonderful-acts, the fortunate *Bajjada Déva*. He was a monarch, a gem in-the-diadem-of-the-world's-circumference; who used only the forcible weapon of his two arms readily on the plain of combat; and in whose bosom the Fortune of Kings herself amorously played, as in the bosom of the foe of *Mura*, (*or Vishnu.*)

9. Like

9. Like *Jayanta*, son to the foe of *Vritta*, (or *Indra*,) like *Shanmuc'ha*, (or *Carticéya*,) son to *Purári*, (or *Mahádéva*,) then sprang from him a fortunate son, with a true heart, invincible ;

10. Who in liberality was *Carna* before our eyes, in truth even *Yudhishtthira*, in glory a blazing Sun, and the rod of *Cála* (or *Yama*, judge of the infernal regions) to his enemies.

11. By whom the great counsellors, who were under his protection, and others near him, are preserved in this world. He is a conqueror, named with propriety *Saranágata Vajrafanjaradéva*.

12. By whom when this world was over-shadowed with-continual-presents-of-gold, for his liberality he was named *Jagadarthi*, (or *Enriching the World*,) in the midst of the three regions of the universe.

13. Those Kings assuredly, whoever they may be, who are endued with minds capable of ruling their respective dominions, praise him for the greatness of his veracity, generosity, and valour ; and to those Princes who are deprived of their domains, and seek his protection, he allots a firm settlement. May he, the grandfather of the *Ráya*, be victorious ! He is the spiritual guide of his counsellors, and they are his pupils. Yet farther,

14. He, by whom the title of *Gómmáya* was conferred on a person who attained the object of his desire ; by whom the realm, shaken by a man named *Eyapadéva*, was even made firm ; and by whom, being the Prince of *Mamalambuva*, (I suppose, *Mambéi*, or *Bombay*,) security



curity from fear was given to me broken *with affliction*. He was the King, named *Srī Virudanca*. How can he be otherwise painted? (*Here six syllables are effaced in one of the Grants; and this verse is not in the other.*)

15. His son *was* named *Bajjadadēva*, a gem on the forehead of monarchs, eminently skilled in morality; whose deep thoughts all the people, clad in horrid armour, praise even to this day.

16. Then was born his brother, the Prince *Aricēsari*, (a lion among his foes,) the best of good men; who, by overthrowing the strong mountain of his proud enemies, did the act of a thunder-bolt; having formed great designs even in his childhood, and having seen the Lord of the Moon (*Mahādēva*) *standing* before him, he marched by his father's order, attended by his troops, and by valour subdued the world.

Yet more —————.

17. Having raised up his slain foe on his sharp sword, he so afflicted the women in the hostile palaces, that their forelocks fell disordered, their garlands of bright flowers dropped from their necks on the vases of their breasts, and the black lustre of their eyes disappeared.

18. A *warriour*, the plant of whose fame grows up over the temple of *Brahmā's* Egg, (the universe,) from-the-repeated-watering-of-it-with-the-drops-that-fell-from-the-eyes-of-the-wives-of-his-slaughtered-foe.

Afterwards by the multitude of his innate virtues (*then follows a compound word of a hundred and fifty-two syllables*)

*syllables*) the-fortunate-*Aricésari-Dévarāja*-Lord-of-the-great-circle-adorned-with-all-the-company-of-princes-with-*Vajrapanjara*-of-whom-men-seek-the-protection-an-elephant's-hook-in-the-forehead-of-the-world-pleased-with-encreasing-vice-a-Flamingo-bird-in-the-pool-decked-with-flowers-like-those-of-paradise-and-with-*Aditya-Pandita*-chief-of-the-districts-of-the-world-through-the-liberality-of-the-Lord-of-the-Western-Sea-holder-of-innate-knowledge-who-bears-a-golden-eagle-on-his-standard-descended-from-the-stock-of-*Īmútavāhana*-king-of-the-race-of-*Silār*-Sovereign-of-the-city-of-*Tagara*-Supreme-ruler-of-exalted-counsellors-assembled when-extended-fame-had-been-attained (*the monarch* thus described) governs-the-whole-region-of-*Cōncana*-consisting-of-fourteen-hundred-villages-with-cities-and-other-places-comprehended-in-many-districts-acquired-by-his-arm. Thus he supports the burden of thought concerning this domain. The Chief-Minister *śrī Vāsapaia*, and the very-religiously-purified *śrī Vārdhiyapaia*, being at this time present, he, the fortunate *Aricésaridévarāja*, Sovereign of the Great Circle, thus addresses even all who inhabit-the-city-*śrī Sthānaca*, (*or the Mansion of Lacshmi*), his-own-kin-men-and-others-there-assembled, princes-counsellors-priests-ministers-superiors-inferiors-subject-to-his-commands, also the-lords-of-districts-the-governors-of-towns-chiefs-of-villages-the-masters-of-families-employed-or-unemployed-servants-of-the-King-and-his-countrymen. Thus he greets all-the-holy-men-and-others-inhabiting-the-city-of-*Hanyamana*: Reverence be to you, as it is becoming, with all the marks of respect, salutation, and praise!

## S T A N Z A.

Wealth is inconstant; youth, destroyed in an instant; and life, placed between the teeth of *Critanta*, (*or Yama*, before mentioned.)



Nevertheless, neglect *is shown* to the felicity of departed ancestors. Oh ! how astonishing are the efforts of men !

And thus.—Youth is publickly-swallowed-up-by-the-giantes Old-Age-admitted-into-its-inner-mansion ; and thebodily-frame-is-equally-obnoxious-to-the-assault-of-death-of-age-and-the-misery-born-with-man-of-separation-between-united-friends-like-falling-from-heaven-into-the-lower-regions. Riches and life are two things more-moveable than-a-drop-of-water-trembling-on-the-leaf-of-a-lotos-shaken-by-the-wind : and the world is like-the-first delicate-foliage-of-a-plantain-tree. Considering this in secret with a firm dispassionate understanding, and also the fruit of liberal donations mentioned *by the wise, I called to mind these*

### S T A N Z A S.

1. In the *Satya*, *Trétâ* and *Dwáper* Ages, great piety was celebrated : but in this *Caliyuga*, the *Muni's* have nothing to commend but liberality.

2. Not so productive of fruit is learning, not so productive is piety, as liberality, say the *Muni's*, in this *Cali* Age. And thus was it said by the Divine *Vyâsa*.

3. Gold *was* the first offspring of Fire ; the Earth *is* the daughter of *Viṣṇu*, and kine are the children of the Sun : the three worlds, *therefore*, are assuredly given by Him, who makes a gift of gold, earth, and cattle.

4. Our deceased fathers clap their hands, our grandfathers exult ; *saying*, “ A donor of land is born in our family : he will redeem us.”

5. A

5. A donation of land to good persons, for holy pilgrimages, and on the (five) solemn days of the moon, is the mean of passing over the deep boundless ocean of the world.

6. White parasols, and elephants mad with pride, (the *insignia* of royalty,) are the flowers of a grant of land : the fruit is *Indra* in heaven.

Thus, confirming the declaration of the-ancient-*Muni's* - learned-in-the-distinction-between-justice-and-injustice, for the sake of benefit to my mother, my father, and myself, on the fifteenth of the bright moon of *Cártica*, in the middle of the year *Pingala*, (perhaps of the *Serpent*,) when nine hundred and forty years, save one, are reckoned as past from the time of King *Saca*, or in figures, the year 939, of the bright moon of *Cártica* 15 ; (that is,  $1708 - 939 = 769$  years ago from Y. C. 1787.) The moon being then full and eclipsed, I having bathed in the opposite sea resembling-the-girdles-round-the-waist-of-the-female-Earth, tinged-with-a-variety-of-rays-like-many-exceedingly-bright-rubies-pearls-and-other-gems, with-water-whose-mud-was-become - musk - through - the-frequent-bathing-of-the-fragrant - bosom - of-beautiful - Goddeffes-rising-up-after-having-dived-in-it;-and having offered to the sun, the divine luminary, the-gem-of-one-circle-of-heaven, eye-of-the-three-worlds, Lord-of-the lotos, a dish embellished-with-flowers-of-various-sorts, (this dish is filled with the plant *Darbha*, rice in the husk, different flowers, and sandal,) have granted to him, who has viewed the preceptor of the Gods and of Demons, who has adored the Sovereign Deity, the-husband-of-*Ambicá*, (or *Durgá*,) has sacrificed-caused-others-to-sacrifice,-has-read-caused-others-to-read-and-has-performed-the-rest-of-the-six(sacerdotal)functions; who-is-eminently-skillful-in-the-whole-business-of-performing-sacrifices,who-



has - held - up - the - root-and-stalk-of-the-sacred-lotos ; who-inhabits-the-city-Sri *St'hánaca*, (or abode of Fortune,) descended from *Jamadagni* ; who-performs-due-rites - in - the - holy-stream ; who-distinctly-knows-the-mysterious - branches, (of the *Védas*,) the domestick priest, the reader, *Srī Ticcapaiya*, son of *Srī Chch'hintapaiya*, the astronomer, for-the-purpose-of-sacrificing-causing - others - to - sacrifice - reading-causing-others-to-read - and - discharging-the-rest-of-the-six (sacerdotal-) duties, of performing-the (daily service of) *Vaiśwadéva* with offerings of rice, milk, and materials of sacrifice, and-of-completing-with due-solemnity the sacrifice-of-fire - of - doing - such-acts-as-must-continually-be-done, and such-as-must-occasionally-be-performed, of paying-due-honours to guests and strangers, and-of-supporting his-own-family, the village of *Chávinára*-standing-at-the-extremity of-the-territory of *Vatsarája*, and the boundaries of which are, to the east, the village of *Púagambà*, and a water-fall-from a mountain ; to the south, the villages of *Nágámbá* and *Múládóngaricà* ; to the west, the river *Sámbarapallicà* ; to the north, the villages of *Sámbivè* and *Cátiyálaca* ; and besides this the full (district) of *Tócabalà Pallicà*, the boundaries of which are to the east, *Sídábali* ; to the south, the river *Mót'hala* ; to the west, *Cácádéva*, *Hallapallicà*, and *Bádaviraca* ; to the north, *Talávali Pallicà* ; and also the village of *Aulacíyá*, the boundaries of which (are) to the east, *Tádága* ; to the south, *Góviní* ; to the west, *Charicà* ; to the north, *Calibalà-yachóli* : (that land) thus surveyed-on-the-four-quarters-and limited-to-its-proper-bounds, with-its-herbage-wood-and-water, and with power-of-punishing-for-the-ten-crimes, except that before given as the portion of *Déva*, or of *Brahmà*, I have hereby released, and limited-by-the-duration-of-the-sun-the-moon-and-mountains, confirmed-with-the-ceremony-of adoration, with a copious effusion of water, and with the highest acts-of-worship ; and the same land shall be enjoyed by his lineal-and-collateral-heirs, or caused-to-be-enjoyed, nor shall disturbance be given by  
any

any person whatever ; since it is thus declared by great *Muni's*.

## S T A N Z A S.

1. The earth is enjoyed by many kings, by *Ságar*, and by others : to whomsoever the soil at any time belongs, to him at that time belong the fruits of it.

2. A speedy gift is attended with no fatigue ; a continued support, with great trouble : therefore even the *Rishi's* declare, that a continuance of support is better than a single gift.

3. Exalted Emperors, of good dispositions, have given land, as *Rámabhadra* advises, again and again : this is the true bridge of justice for sovereigns : from time to time (O Kings) that bridge must be repaired by you.

4. Those possessions here below, which have been granted in former times by sovereigns, given for-the-fake-of-religion-increase-of-wealth-or-of-fame, are exactly equal to flowers, which have been offered to a Deity : what good man would resume *such gifts* ?

Thus, confirming the precepts of ancient *Muni's*, all future kings must gather the fruit-of-observing-religious-duties ; and let not the stain-of-the-crime-of-destroying-this-grant be borne henceforth by any-one ; since, whatever *prince*, being supplicated, shall, through avarice, having - his - mind - wholly - surrounded - with - the - gloom - of - ignorance - contemptuously - dismiss - the - injured - suppliant, he, being guilty of five great and *five* small crimes,



crimes, shall long in darkness inhabit *Raurava*, *Mahâ-raurava*, *Andha*, *Támisra*, and the other places of punishment. And thus it is declared by the divine *Vyása* :

### S T A N Z A S.

1. He who seizes land, given-by-himself, or by-another, (sovereign,) will rot among worms, himself a worm, in the midst of ordure.

2. They who seize granted-land, are born again, living with great fear in dry cavities of trees in the unwatered forests on the *Vinddhian* (mountains.)

3. By seizing one cow, one vesture, or even one nail's breadth of ground, a king continues in hell till an universal destruction of the world has happened.

4. By (a gift of) a thousand gardens, and by (a gift of) a hundred pools of water, by (giving) a hundred *lac* of oxen, a disseisor of (granted) land is not cleared from offence.

5. A grantor of land remains in heaven sixty thousand years ; a disseisor, and he who refuses to do justice, continues as many (years) in hell,

And, agreeably to this, in what is written by the hand of the Secretary, (the King) having ordered it, declares his own intention ; as it is written by the command of me, Sovereign of the Great Circle, the fortunate *Aricésari Dévarāja*, son of the Sovereign of the Great Circle, the Fortunate, Invincible, *Dévarāja*.

And

And this is written, by order of the Fortunate King, by me *Jó-uba*, the brother's-son-of *śrī Nágalaiva*-the-great-Bard,-dwelling-in the royal palace: engraved-on-plates-of-copper by *Védapaiya*'s son *Màna Dhára Paiya*. Thus (it ends.)

Whatever herein (may be) defective in-one-syllable, or have-one-syllable-redundant, all that is (nevertheless) complete evidence (of the grant.) Thus (ends the whole.)



## TO THE PRESIDENT.

DEAR SIR,

I DO myself the honour to send you a few Remarks on *Tagara*, and beg leave to submit them to your Judgment. Inquiries of that kind are generally very dry; and unluckily I have no talent for amplification. I have collected all I could find in the ancient authors, and endeavoured, by bringing the whole together, to elucidate a subject which must be interesting to the *Asiatick Society*; and this, I hope, will secure me their indulgence. I have been as sparing as possible of *Greek* quotations; I am not fond of them; however, I have ventured a few, which I thought absolutely necessary. With respect to the *historical* part, you will find, I am not conversant with the *Hindu* Antiquities; indeed, I have no time to study languages.

I am,

DEAR SIR,

Your most obedient humble Servant,

F. WILFORD.

*Russapugla, June 10, 1787.*

REMARKS

REMARKS  
ON THE  
CITY OF TAGARA.

By Lieut. FRANCIS WILFORD.

THE expedition of *Alexander* having made the *Greeks* acquainted with the riches of *India*, they soon discovered the way by sea into that country; and, having entered into a commercial correspondence with the natives, they found it so beneficial, that they attempted a trade hither.

*Ptolemy Philadelphus*, king of *Egypt*, in order to render the means easy to merchants, sent one *Dionysius* into the southern parts of *India*, to inquire into the nature of that country, its produce and manufactures.

It was then *Tagara* began to be known to the *Greeks*, about 2050 years ago.

*Arrian*, in his *Periplus Maris Erythræi*, says it was a large city, and that the produce of the country, at that early period, consisted chiefly of coarse *Dungarees*, (*Othonium vulgare*,) of which vast quantities were exported; muslins of all sorts, (*Sindones omnis generis*;) and a kind of cotton stuff, dyed of a whitish purple, and very much of the colour of the flowers of mallows, whence called *Molochyna*.

All kinds of mercantile goods throughout the *Deccan* were brought to *Tagara*, and from thence conveyed on carts to *Baroach*, (*Barygaza*.)

*Arrian*



*Arrian* informs us, that *Tagara* was about ten days journey to the eastward of another famous mart, called *Plithana*, or *Plúthana*.

That *Plúthana* was twenty days journey to the southward of *Baroach*. Also,

That the road was through the *Bala-gaut* mountains.

And here we must observe, that the *Latin* translation of the *Periplus* \* by *Stuckius* is very inaccurate, and often erroneous; as in the following passage, where *Arrian*, speaking of *Tagara*, says

“Καταγεται δε εξ αυτων πορειαις αμαξων και ανοδοις μεγισταις εις την Βαρυγαζαν:”

which *Stuckius* translates thus :

“Ex his autem emporiis, per loca invia et difficillima,  
“res Barygazam plaustris convehuntur.”

But it should be,

“Ex his autem emporiis, per maximos ascensus, res  
“Barygazam deorsum feruntur.”

*Καταγω* signifies *deorsum ferre*, (to bring down,) not *convehere*.

*Ανοδαι μεγισταις* should be translated *per maximos ascensus*. *Ανοδια*, or *ανodos*, in this place, signifies *an ascent*, *a road over hills*; and this meaning is plainly pointed out by the words *καταγεται* and *μεγισταις*.

In

\* *Geographiæ veteris Scriptores Græci minores*. Vol. I.

In short, *ανδια μεγαται* is the true translation of the Hindoo word *Bala-gaut*, the name of the mountains through which the goods from *Tagara* to *Baroach* used to be conveyed.

This passage in *Arrian* is the more interesting, as it fixes the times when the *Bala-gaut* Mountains were first heard of in *Europe*.

The bearing from *Tagara* to *Plúthana* is expressly mentioned by *Arrian*, (*προς ανατολην*;) but is left out by *Stuckius*.

*Plúthana* is an important point to be settled, as it regulates the situation of *Tagara*.

It still exists, and goes nearly by the same name, being called to this day *Pultanah*. It is situated on the southern bank of the *Godávery*, about 217 British miles to the southward of *Baroach*.

These 217 miles being divided by twenty, the number of days travellers were between *Pultanah* and *Baroach*, according to *Arrian*, give nearly eleven miles per day, or five coss, which is the usual rate of travelling with heavy loaded carts.

The onyx, and several other precious stones, are still found in the neighbourhood of *Pultanah*, as related by *Arrian*; being washed down by torrents from the hills during the rains, according to *Pliny*.

*Arrian* informs us, that the famous town of *Tagara* was about ten days journey to the eastward of *Pultanah*.

According



According to the above proportion, these ten days (or rather somewhat less \*) are equal to about 100 British miles; and consequently *Tagara*, by its bearing and distance from *Pultanah*, falls at *Deoghiri*, a place of great antiquity, and famous through all *India*, on account of the *Pagodas* of *Eloura*. It is now called *Doulet-abad*, and about four coss N. W. of *Aurungabad*.

*Ptolemy* agrees very well with *Arrian*, with respect to distances and bearings, if we admit that he has mistaken *Baithana*, or *Paithana*, for *Plithana*; and this, I am pretty sure, is really the case, and may be easily accounted for, as there is very little difference between ΠΑΙΘΑΝΑ and ΠΛΙΘΑΝΑ in the *Greek* character.

*Paithana*, now *Pattan*,† or *Puttan*, is about half way between *Tagara* and *Plithana*.

According to *Ptolemy*, *Tagara* and *Pattan* were situated to the northward of the *Baund-Ganga*, (*Binda* or *Bynda* river,) commonly called *Godavery*; and here *Ptolemy* is very right.

In *M. Bussy's* marches, *Pattan* is placed to the southward of the *Godavery*; but it is a mistake.

It appears from *Arrian's Periplus*, that, on the arrival of the *Greeks* into the *Deccan*, above 2000 years ago, *Tagara* was the *metropolis* of a large district called *Ariaca*, which comprehended the greatest part of *Subah Aurungabad*, and the southern part of *Concan*; for the northern part of that district, including *Damaun Callian*, the *Island of Salfet*, *Bombay*, &c. belonged to the *Rajah* of

\* Ως ἡμερῶν δέκα quasi dies decem.

† *Patina* Tab. Peutinger. *Patinna* Anonym. Ravenn.

of *Larikeh*, or *Lar*, according to *Arrian* and *Ebn Saïd al Magrebi*.

It is necessary to observe here, that, though the author of the *Periplus* is supposed to have lived about the year 160 of the present era, yet the materials he made use of in compiling his directory are far more ancient; for, in speaking of *Tagara*, he says that the *Greeks* were prohibited from landing at *Callian*, and other harbours on that coast. Now it is well known that, after the conquest of *Egypt*, the *Romans* had monopolized the whole trade to *India*, and would allow no foreigners to enter the Red Sea; and consequently this passage has reference to an earlier period, previous to the conquest of *Egypt* by the *Romans*.

About the middle of the first century, *Tagara* was no longer the capital of *Ariaca*, *Rajah Salbahan* having removed the seat of the empire to *Pattan*.

*Ptolemy* informs us, that *Paithana*, or *Pattan*, had been the residence of a prince of that country, whose name the *Greeks* have strangely disfigured: we find it variously spelt, in different MSS. of *Ptolemy*, *Siripolemæus*, *Siropolemæus*, *Siroptolemæus*, &c.

Yet, when we consider that, whenever *Pattan* is mentioned by the *Hindoos*, they generally add, it was the residence of *Rajah Salbahan*,\* who, in the dialect of the *Deccan*, is called *Salivanam*, or *Salibanam*, I cannot help thinking that the *Greeks* have disfigured this last word *Salibanam* into *Saripalam*, from which they have made *Siripolemæus*, *Siropolemæus*, &c.

*Bickermajit* ruled for some time over the northern parts of the *Deccan*; but the *Rajahs*, headed by *Salbahan*,  
having

\* Making use of the very words of *Ptolemy*.



having revolted, they gave him battle, and he was slain. *Tagara* became again the *metropolis* of *Ariaca*; at least it was so towards the latter end of the eleventh century, as appears from a grant of some lands in *Concan*, made by a *Rajah* of *Tagara*: this grant still exists, and was communicated to the *Asiatick Society* by General *Carnac*.

When the *Mussulmans* carried their arms into the *Deccan* about the year 1293, *Tagara*, or *Deoghir*, was still the residence of a powerful *Rajah*, and remained so till the time of *Shah-Jehan*, when the district belonging to it became a *Subah* of the *Mogul Empire*. Then *Tagara* was deserted; and *Kerkhi*, four coss to the south-east of it, became the capital. This place is now called *Aurungabad*.

Thus was destroyed the ancient kingdom or *Rajaship* of *Tagara*, after it had existed with little interruption above 2000 years; that is to say, as far as we can trace back its antiquity.

It may appear astonishing, that though the *Rajah* of *Tagara* was possessed of a large tract on the sea-coast, yet all trade was carried on by land.

Formerly it was not so. On the arrival of the *Greeks* into the *Deccan*, goods were brought to *Callian*, near *Bombay*, and then shipped off. However, a *Rajah* of *Larikeh*, or *Lar*, called *Sandanes*, according to *Arrian*, would no longer allow the *Greeks* to trade either at *Callian*, or at the harbours belonging to him on that coast, except *Baroach*; and whenever any of them were found at *Callian*, or in the neighbourhood, they were confined, and sent to *Baroach* under a strong guard. *Arrian*, being a *Greek* himself, has not thought proper to inform us what could induce the *Rajah* to behave in this manner to the *Greeks*; but his silence is a convinc-

ing proof that they had behaved amiss; and it is likely enough, that they had attempted to make a settlement in the Island of *Salsæt*, in order to make themselves independent, and facilitate their conquests into the *Deccan*.

The fears of the *Rajah* were not groundless; for the *Greek* kings of *Bactriana* were possessed of the *Punjah*, *Cabul*, &c. in the North of *India*.

There were other harbours, to the south of *Callian*, belonging to the *Rajah* of *Tagara*, but they were not frequented on account of *pirates*, who, according to *Pliny*, *Arrian*, and *Ptolemy*, infested these countries in the very same manner they do now.



## XX.

## ON THE PANGOLIN OF BAHAR.

BY

MATTHEW LESLIE, Esq.

THE singular animal which M. *Buffon* describes by the name of *Pangolin*, is well known in *Europe* since the publication of his *Natural History*, and *Goldsmith's* elegant *Abridgment* of it; but, if the figure exhibited by *Buffon* was accurately delineated from the three animals, the spoils of which he had examined, we must consider that which has been lately brought from *Caracdiah* to *Chitra*, and sent thence to the Presidency, as a remarkable variety, if not a different species, of the *Pangolin*. Ours has hardly any neck; and, though some filaments are discernible between the scales, they can scarce be called bristles. But the principal difference is in the tail; that of *Buffon's* animal being long, and tapering almost to a point; while that of ours is much shorter, ends obtusely, and resembles, in form and flexibility, the tail of a lobster. In other respects, as far as we can judge from the dead subject, it has all the characters of *Buffon's Pangolin*; a name derived from that by which the animal is distinguished in *Java*, and consequently preferable to *Manis*, or *Pholidotus*, or any other appellation deduced from an *European* language. As to the *scaly lizard*, the *scaled armadillo*, and the *five-nailed ant-eater*, they are manifestly improper designations of this animal; which is neither a *lizard*, nor an *armadillo*, in the common acceptation; and, though it be an *ant-eater*, yet it essentially differs from the *hairy* quadruped usually known by that general description. We are told that the *Malabar* name of this animal is *Alungu*. The natives of *Bahar* call it *Bajar-cit*, or, as they explain the word, *stone-vermine*;



THE VAJRACITA.

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*vermine*; and in the stomach of the animal before us was found about a teacupful of small stones, which had probably been swallowed for the purpose of facilitating digestion: but the name alludes, I believe, to the hardness of the scales; for *Vajracīta* means, in *Sanskrit*, the *diamond* or *thunderbolt reptile*; and *Vajra* is a common figure in the *Indian* poetry for any thing excessively hard. The *Vajracīta* is believed by the *Pandits* to be the animal which gnaws their *sacred stone*, called *Sálgrámasíla*; but the *pangolin* has apparently no teeth; and the *Sálgráms*, many of which look as if they had been worm-eaten, are perhaps only decayed in part by exposure to the air.

This animal had a long tongue, shaped like that of a *cameleon*; and if it was nearly adult, as we may conclude from the young one found in it, the dimensions of it were much less than those which *Buffon* assigns generally to his *pangolin*; for he describes its length as six, seven, or eight feet, including the tail, which is almost, he says, as long as the body, when it has attained its full growth; whereas ours is but thirty-four inches long, from the extremity of the tail to the point of the snout, and the length of the tail is fourteen inches; but, exclusively of the head, which is five inches long, the tail and body are, indeed, nearly of the same length; and the small difference between them may show, if *Buffon* be correct in this point, that the animal was young. The circumference of its body in the thickest part is twenty inches, and that of the tail only twelve.

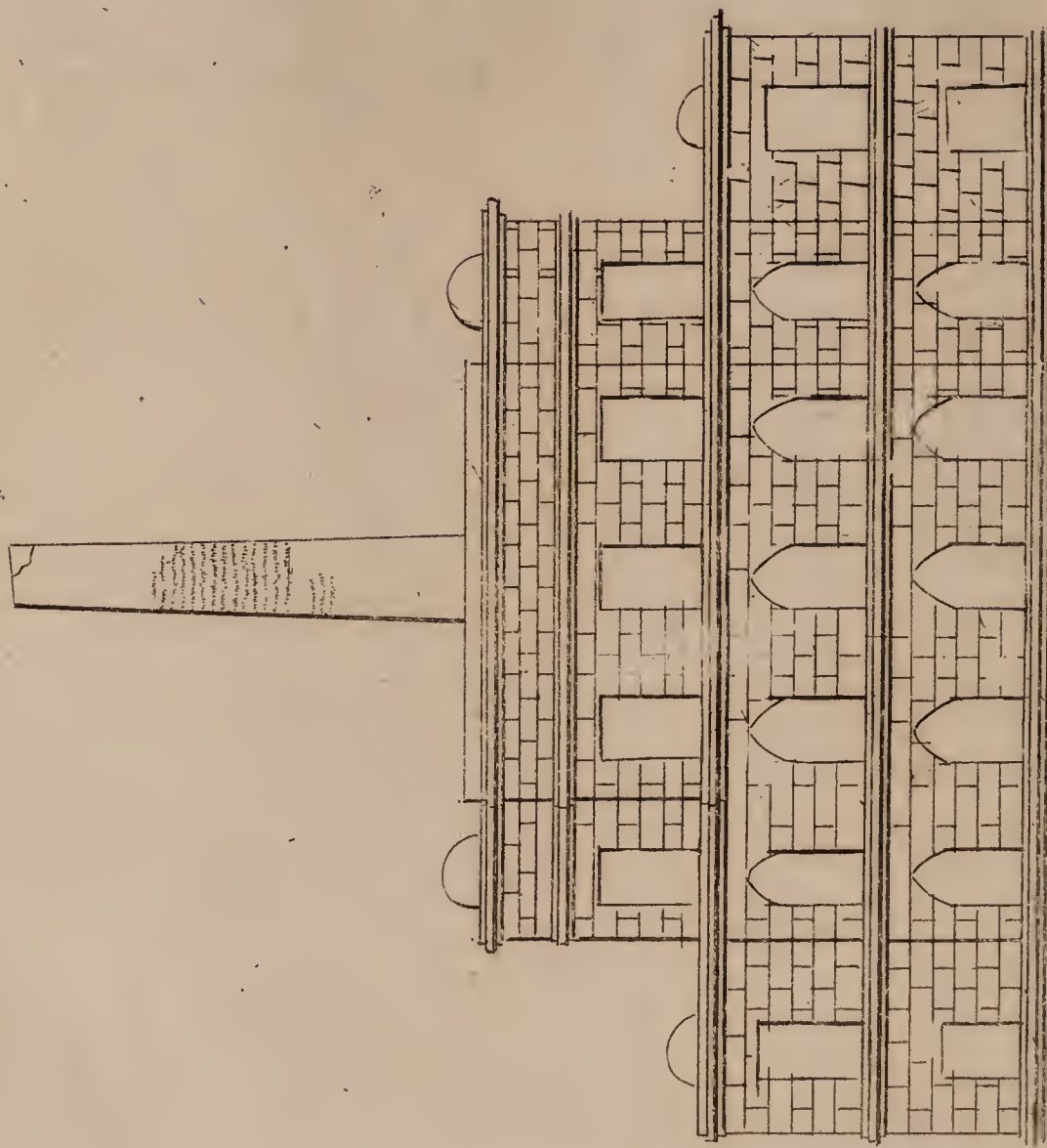
We cannot venture to say more of this extraordinary creature, which seems to constitute the first step from the quadruped to the reptile, until we have examined it alive, and observed its different instincts; but as we are assured that it is common in the country round



*Khánpúr*, and at *Chátigám*, where the native *Muselmans* call it the *land-carp*, we shall possibly be able to give, on some future occasion, a fuller account of it. There are in our *Indian* provinces many animals, and many hundreds of medicinal plants, which have either not been described at all, or, what is worse, ill described, by the naturalists of Europe: and, to procure perfect descriptions of them from actual examination, with accounts of their several uses in medicine, diet, or manufactures, appears to be one of the most important objects of our institution.







THE STAFF OF FIRUZ SHAH.

## XXI.

## INSCRIPTIONS

ON THE

## STAFF OF FIRUZ SHAH.

TRANSLATED FROM THE SANSKRIT.

*As explained by* RADHACANTA SARMAN.

ON a very singular monument near *Dehli*, an outline of which is here exhibited, and which the natives call the *Staff of Fîrûz Shah*, are several old Inscriptions, partly in ancient *Nâgarî* letters, and partly in a character yet unknown; and Lieutenant Colonel *Polier*, having procured exact impressions of them, presents the Society with an accurate copy of all the Inscriptions. Five of them are in *San scrit*, and, for the most part, intelligible; but it will require great attention and leisure to decypher the others. If the language be *San scrit*, the powers of the unknown letters may, perhaps, hereafter be discovered by the usual mode of decyphering; and that mode, carefully applied, even at first, may lead to a discovery of the language. In the mean time, a literal version of the legible Inscriptions is laid before you. They are, on the whole, sufficiently clear; but the sense of one or two passages is at present inexplicable.

## I.

The first, on the southwest side of the pillar, is perfectly detached from the rest: it is about seventeen feet from the base, and two feet higher than the other inscriptions.



O'M.

In the year 1230, on the first day of the bright half of the month *Vaisáh'ch* (a monument) of the Fortunate-*Visala-Déva*-son of the-Fortunate-*Amilla-Déva*, -King-of-*Sácambharì*.

II.

The next, which is engraved as a specimen of the character, consists of two stanzas in four lines; but each hemistich is imperfect at the end, the two first wanting *seven*, and the two last *five*, syllables. The word *Sácambharì* in the former inscription, enables us to supply the close of the *third* hemistich.

O'M.

As far as *Vindhya*, as far as *Himádri*, (the Mountain of Snow,) he was not deficient in celebrity . . . . . making *Aryáverta* (the Land of Virtue, or *India*) even once more what its name signifies . . . . . He having departed, *Prativáhamána Tilaca* (is) king of *Sácambharì*: (*Sácamb* only remains on the monument.) By us (the region between) *Himawat* and *Vindhya* has been made tributary.

In the year from *Srì Vicramáditya* 123, in the bright half of the month *Vaisáh'h* . . . . . at that time the *Rāja-putra Srì Sallaca* was Prime Minister.

The second stanza, supplied partly from the last inscription, and partly by conjecture, will run thus :

*vritté sa prativáhamána tilacah śácambharibhūpatih  
asmábhih caradam vyadhāyi himawadvindhya tavīmañ-  
dalam*

The

॥ आ विंशादादिमाद विंशसि न विहन् ।  
 आ यो व न्नोपघातं न च पि कुं त वा ।  
 ब्राह्म सं प्र तिं चाद मा न ति न कः ॥ शा कं  
 ॐ मा ह्नि क च दं ग्रा ध पि दि म व दि ध्या  
 नं व दृं छी विं श गा दि म २२ वि शा य सु वि  
 व अ म य म दा म चि वा ऊ प्र च श्री म न क





The date 123 is here perfectly clear; at least it is clear that only *three* figures are written, without even room for a cypher after them; whence we may guess that the double circle in the former inscription was only an ornament, or the neutral termination *am*; if so, the date of *both* is the year of CHRIST *sixty-seven*: but if the double circle be a *zero*, the monument of *Vísala Déva* is as modern as the year 1174, or *nineteen* years before the conquest of *Dehli* by *Shihá'bud'dín*.

### III. and IV.

The two next Inscriptions were in the same words; but the stanzas, which in the fourth are extremely mutilated, are tolerably perfect in the third, wanting only a few syllables at the beginning of the hemistichs:

*yah cshívéshu prahartá nripatishu vinamatcandharéshu  
prafannah*

—*vah'sambi puríndrah jagatí vijayatè vísala cshónipálah*

. . . *da sájnaya ésha vijayì santánajánátmajah*

. . *púnán cshemástu bruvátamudyógaś únyanmanah*

*He*, who is resentful to kings intoxicated with pride, indulgent to those whose necks are humbled, an *Indra* in the city of *Causámbi*, (I suspect *Causámbi*, a city near *Hastinápur*, to be the true reading,) *who* is victorious in the world, *Vísala*, sovereign of the earth; he gives . . . his commands being obeyed, he is a conqueror, the son of *Santánajána*, whose mind, when his foes say, “Let there be mercy,” is free from further hostility.

This inscription was engraved, in the presence of *Srì Talaca Rája*, by *Srípati*, the son of *Máhava*, a *Cáyast'ha*, of a family in *Gáúda*, or *Bengal*.



## V.

The fifth seems to be an elegy on the death of a king named *Vigraha*, who is represented as only flumbering. The last hemistich is hardly legible, and very obscure; but the sense of both stanzas appears to be this.

## O'M.

1. An offence to the eyes of (thy) enemy's confort (thou) by-whom-fortune-was-given-to-every suppliant, thy fame, joined to extensive dominion, shines, as we desire, before us: the heart of (thy) foes was vacant, even as a path in a desert, where men are hindered from passing, O fortunate *Vigraha Rájadéva*, in the jubilee occasioned by thy march.

2. May thy abode, O *Vigraha*, sovereign of the world, be fixed, as in reason, (it ought,) in the bosoms, embellished with Love's allurements, and full of dignity, of the women with beautiful eyebrows, who were married to thy enemies! Whether thou art *Indra*, or *Viśhnu*, or *Siva*, there is even no deciding: thy foes (are) fallen, like descending water. Oh! why dost thou through delusion continue sleeping?

## XXII.

A

## CONVERSATION

WITH

ABRAM, AN ABYSSINIAN,

CONCERNING THE

*City of GWENDER and the SOURCES of the NILE.**By the PRESIDENT.*

HAVING been informed that a native of *Abyssinia* was in *Calcutta*, who spoke *Arabick* with tolerable fluency, I sent for and examined him attentively on several subjects with which he seemed likely to be acquainted. His answers were so simple and precise, and his whole demeanor so remote from any suspicion of falsehood, that I made a minute of his examination, which may not perhaps be unacceptable to the Society. *Gwender*, which *Bernier* had long ago pronounced a capital city, though *Ludolf* asserted it to be only a military station, and conjectured, that in a few years it would wholly disappear, is certainly, according to *Abram*, the Metropolis of *Abyssinia*. He says, that it is nearly as large and as populous as *Misr*, or *Kahera*, which he saw on his pilgrimage to *Jerusalem*; that it lies between two broad and deep rivers, named *Caha* and *Ancrib*, both which flow into the *Nile* at the distance of about fifteen days journey; that all the walls of the houses are of a red stone, and the roofs of thatch; that the streets are like those of *Calcutta*, but that the ways by which the king passes are very spacious; that the palace, which has a plastered roof, resembles a fortress, and stands in the heart of the city; that the markets of the town abound in pulse, and have also



also wheat and barley, but no rice; that sheep and goats are in plenty among them, and that the inhabitants are extremely fond of milk, cheese, and whey; but that *the country people* and *soldiery* make no scruple of drinking the blood, and eating the raw flesh, of an ox, which they cut without caring whether he is dead or alive; that this savage diet is, however, by no means general. Almonds, he says, and dates, are not found in his country; but grapes and peaches ripen there; and in some of the distant provinces, especially at *Cárudár*, wine is made in abundance; but a kind of mead is the common inebriating liquor of the *Abyssinians*. The late King was *Tilca Mahút*, (the first of which words means *root* or *origin*;) and the present his brother, *Tilca Ferjis*. He represents the royal forces at *Gwender* as considerable; and asserts, perhaps at random, that near forty thousand horse are on that station. The troops are armed, he says, with muskets, lances, bows and arrows, cimeters, and hangers. The council of state consists, by his account, of about forty Ministers, to whom almost all the executive part of government is committed. He was once in the service of a *Vazir*, in whose train he went to see the fountains of the *Nile* or *Abey*, usually called *Alawy*, about eight days journey from *Gwender*. He saw three springs, one of which rises from the ground with a great noise, that may be heard at the distance of five or six miles. I showed him the description of the *Nile* by Gregory of *Amhára*, which *Ludolf* has printed in *Ethiopick*. He both read and explained it with great facility; whilst I compared his explanation with the *Latin* version, and found it perfectly exact. He asserted of his own accord, that the description was conformable to all that he had seen and heard in *Ethiopia*; and for that reason I annex it. When I interrogated him on the languages and learning of his country, he answered, that six or seven tongues at least were spoken there; that the most elegant idiom, which the King used, was the *Ambarick*; that the *Ethiopick* contained, as it is well known, many *Arabick* words; that, besides  
their



their sacred books, as the Prophecy of *Enoch*, and others, they had Histories of *Abyssinia*, and various literary compositions; that their language was taught in schools and colleges, of which there were several in the Metropolis. He said, that no *Abyssinian* doubted the existence of the royal prison called *Wahinin*, situated on a very lofty mountain, in which the sons and daughters of their Kings were confined; but that, from the nature of the thing, a particular description of it could not be obtained. “All these matters (said he) are explained, I suppose, in the writings of *Yákúb*, whom I saw thirteen years ago in *Gwender*. He was a physician, and had attended the King’s brother, who was also a *Vazir*, in his last illness. The prince died; yet the King loved *Yákúb*; and, indeed, all the court and people loved him. The King received him in his palace as a guest, supplied him with every thing that he could want; and, when he went to see the sources of the *Nile*, and other curiosities, (for he was extremely curious,) he received every possible assistance and accommodation from the royal favour. He understood the languages, and wrote and collected many books, which he carried with him.” It was impossible for me to doubt (especially when he described the person of *Yákúb*) that he meant *James Bruce*, Esq. who travelled in the dress of a *Syrian* physician, and probably assumed with judgment a name well known in *Abyssinia*. He is still revered on *Mount Sinai* for his sagacity in discovering a spring, of which the Monastery was in great need. He was known at *Jedda* by *Mír Moham-med Hussain*, one of the most intelligent *Mahomedans* in *India*; and I have seen him mentioned with great regard in a letter from an *Arabian* merchant at *Mokhá*. It is probable that he entered *Abyssinia* by the way of *Musuwwa*, a town in the possession of the *Muselmans*, and returned through the desert mentioned by *Gregory* in his description of the *Nile*. We may hope that Mr. *Bruce* will publish an account of his interesting travels, with a version of the Book of *Enoch*, which no man but him-



self can give us with fidelity. By the help of *Abyssinian* records, great light may be thrown on the History of *Yemen* before the time of *Muhammed*; since it is generally known that four *Ethiop* kings successively reigned in that country, having been invited over by the natives to oppose the tyrant *Dhú Nawás*; and that they were, in their turn, expelled by the arms of the *Himyarick* Princes, with the aid of *Anushirvan*, king of *Persia*, who did not fail, as it usually happens, to keep in subjection the people whom he had consented to relieve. If the annals of this period can be restored, it must be through the histories of *Abyssinia*, which will also correct the many errors of the best *Asiatick* writers on the *Nile*, and the countries which it fertilizes.

## ON THE COURSE OF THE NILE.

THE *Nile*, which the *Abyssinians* know by the names of *Abey*, and *Alawy*, or the *Giant*, gushes from several springs at a place called *Sucút*, lying on the highest part of *Dengalá*, near *Gojjám*, to the west of *Bajemdir*, and the lake of *Dara* or *Wed*, into which it runs with so strong and rapid a current, that it mixes not with the other waters, but rides or swims, as it were, above them.

All the rains that fall in *Abyssinia*, and descend in torrents from the hills, all streams and rivers, small and great, except the *Hanázó*, which washes the plains of *Hengót*, and the *Hawásh*, which flows by *Dewár* and *Fetgár*, are collected by this king of waters, and, like vassals, attend his march. Thus enforced, he rushes, like a hero exulting in his strength, and hastens to fertilize the land of *Egypt*, on which no rain falls. We must except also those *Ethiopian* rivers which rise in countries bordering on the ocean, as the kingdoms of *Cambát*, *Gurájy*, *Wásy*, *Náriyah*, *Gásy*, *Wej*, and *Zinjiro*, whose waters are disembogued into the sea.

When the *Alawy* has passed the Lake, it proceeds between *Gojjám* and *Bajemdir*, and leaving them to the west and east, pursues a direct course towards *Amhárá*, the skirts of which it bathes, and then turns again to the west, touching the borders of *Walaka*; whence it rolls along *Múgár* and *Shawai*, and passing *Bazáwá* and *Gongá*, descends into the low lands of *Shankila*, the country of the Blacks: thus it forms a sort of spiral round the province of *Gojjám*, which it keeps for the most part on its right.

Here



Here it bends a little to the east, from which quarter, before it reaches the districts of *Sennár*, it receives two large rivers; one called *Tacazzy*, which runs from *Tegri*; and the other, *Gwangue*, which comes from *Dembeíá*.

After it has visited *Sennár*, it washes the land of *Dongolá*, and proceeds thence to *Nubia*, where it again turns eastward, and reaches a country named *Abrim*, where no vessels can be navigated, by reason of the rocks and crags which obstruct the channel. The inhabitants of *Sennár* and *Nubia* may constantly drink of its water, which lies to the east of them like a strong bulwark; but the merchants of *Abyssinia*, who travel to *Egypt*, leave the *Nile* on their right, as soon as they have passed *Nubia*, and are obliged to traverse a desert of sand and gravel, in which for fifteen days they find neither wood nor water. They meet it again in the country of *Reís*, or *Upper Egypt*, where they find boats on the river, or ride on its banks, refreshing themselves with its salutary streams.

It is asserted by some travellers, that, when the *Alawy* has passed *Sennár* and *Dongolá*, but before it enters *Nubia*, it divides itself; that the great body of water flows entire into *Egypt*, where the smaller branch (the *Niger*) runs westward, not so as to reach *Barbary*, but towards the country of *Alwáh*, whence it rushes into the Great Sea. The truth of this fact I have verified, partly by my own observations, and partly by my inquiries among intelligent men; whose answers seemed the more credible, because, if so prodigious a mass of water were to roll over *Egypt* with all its wintry increase, not the land only, but the houses and towns, of the *Egyptians* must be overflowed.

XXIII.  
ON THE  
TRIAL BY ORDEAL  
AMONG THE  
HINDUS.

By A'LI IBRA'HÍM KHA'N,  
CHIEF MAGISTRATE AT BANARES.

*Communicated by WARREN HASTINGS, Esq.*

THE modes of trying offenders by an appeal to the Deity, which are described at large in the *Mitácsherá*, or Comment on the *Dherma Sástra*, in the *Chapter of Oaths*, and other ancient books of *Hindu Law*, are here sufficiently explained, according to the interpretation of learned *Pandits*, by the well-wisher to mankind, *A'li Ibráhím Khán*.

The word *Divya*, in *Sanscrit*, signifies the same with *Parícshà*, or *Parikhyà*, in *Bháshà*, *Kajam* in *Arabick*, and *Saucand* in *Persian*; that is, *an oath*; or the form of invoking the Supreme Being to attest the truth of an allegation; but it is generally understood to mean the trial by *ordeal*, or the form of appealing to the immediate interposition of the Divine Power.

Now this trial may be conducted in *nine* ways. First, by the *balance*; secondly, by *fire*; thirdly, by *water*; fourthly, by *poison*; fifthly, by the *Cósha*, or water in which an idol has been washed; sixthly, by *rice*; seventhly, by *boiling oil*; eighthly, by *red-hot iron*; ninthly, by *images*.

I. Ordeal



I. Ordeal by the *balance* is thus performed. The beam having been previously adjusted, the cord fixed, and both scales made perfectly even, the person accused and a *Pandit* fast a whole day; then, after the accused has been bathed in sacred water, the *hóma*, or *oblation*, presented to *fire*, and the deities worshipped, he is carefully weighed; and, when he is taken out of the scale, the *Pandits* prostrate themselves before it, pronounce a certain *mentra*, or *incantation*, agreeably to the *Sástras*, and, having written the substance of the accusation on a piece of paper, bind it on his head. Six minutes after they place him again in the scale; and if he weigh more than before, he is held guilty; if less, innocent: if exactly the same, he must be weighed a third time; when, as it is written in the *Mitácsherá*, there will certainly be a difference in his weight. Should the balance, though well fixed, break down, this would be considered as a proof of his guilt.

II. For the *fire-ordeal* an excavation, nine hands long, two spans broad, and one span deep, is made in the ground, and filled with a fire of *pippal* wood: into this the person accused must walk barefooted; and if his foot be unhurt, they hold him blameless; if burned, guilty.

III. *Water-ordeal* is performed by causing the person accused to stand in a sufficient depth of water, either flowing or stagnant, to reach his navel; but care should be taken that no ravenous animal be in it, and that it be not moved by much air. A *Bráhma*n is then directed to go into the water, holding a staff in his hand; and a soldier shoots three arrows on dry ground from a bow of cane. A man is next dispatched to bring the arrow which has been shot farthest; and, after he has taken it up, another is ordered to run from the edge of the water; at which instant the person accused is told to grasp the foot or the staff of the *Bráhma*n, who stands near him in the water, and immediately to dive into it.

He

He must remain under water till the two men who went to fetch the arrows are returned; for if he raise his head or body above the surface before the arrows are brought back, his guilt is considered as fully proved. In the village near *Banâres*, it is the practice for the person, who is to be tried by this kind of *ordeal*, to stand in water up to his navel, and then, holding the foot of a *Brâhman*, to dive under it as long as a man can walk fifty paces very gently. If before the man has walked thus far the accused rise above the water, he is condemned; if not, acquitted.

IV. There are two sorts of trial by *poison*. First, the *Pandits* having performed their *hóma*, and the person accused his ablution, two *retti's* and a half, or seven barley-corns, of *viśhanâga*, a poisonous root, or of *san-c'hya*, (that is, white arsenick,) are mixed in eight *mâsha's*, or sixty-four *retti's*, of clarified *butter*, which the accused must eat from the hand of a *Brâhman*. If the poison produce no visible effect, he is absolved; otherwise, condemned. Secondly, the hooded snake, called *nâga*, is thrown into a deep earthen pot, into which is dropped a ring, a seal, or a coin. This the person accused is ordered to take out with his hand; and if the serpent bite him, he is pronounced guilty; if not, innocent.

V. Trial by the *Cósha* is as follows: The accused is made to drink three draughts of the water in which the images of the *Sun*, of *Dévî*, and other Deities, have been washed for that purpose; and if within fourteen days he has any sickness or indisposition, his crime is considered as proved.

VI. When several persons are suspected of theft, some dry rice is weighed with the sacred stone called *śâlgrâm*; or certain *ślócas* are read over it; after which the suspected persons are severally ordered to chew a quantity



quantity of it: as soon as they have chewed it, they are to throw it on some leaves of *pippal*, or, if none be at hand, on some *b'húrja patra*, or bark of a tree from *Népál* or *Cashmír*. The man from whose mouth the rice comes dry, or stained with blood, is holden guilty; the rest are acquitted.

VII. The ordeal by *hot oil* is very simple: when it is heated sufficiently, the accused thrusts his hand into it; and if he be not burned, is held innocent.

VIII. In the same manner they make an *iron ball*, or the *head of a lance*, red hot, and place it in the hands of the person accused; who, if it burn him not, is judged guiltless.

IX. To perform the ordeal by *dharmárch*, which is the name of the *śloka* appropriated to this mode of trial, either an image, named *Dharma*, or the Genius of Justice, is made of silver, and another, called *Adharma*, of clay or iron, both of which are thrown into a large earthen jar; and the accused, having thrust his hand into it, is acquitted if he bring out the silver image, but condemned if he draw forth the iron. Or the figure of a deity is painted on white cloth, and another on black; the first of which they name *Dharma*, and the second, *Adharma*. These are severally rolled up in cow-dung, and thrown into a large jar, without having ever been shown to the accused; who must put his hand into the jar, and is acquitted or convicted, as he draws out the figure on white or on black cloth.

It is written in the comment on the *Dherma Sástra*, that each of the four principal casts has a sort of ordeal appropriated

appropriated to it; that a *Bráhma*n must be tried by the *balance*, a *Cshatriya* by *fire*, a *Vaisya* by *water*, and a *Súdra* by *poison*: but some have decided that any ordeal, except that by *poison*, may be performed by a *Bráhma*n, and that a man of any cast may be tried by the *balance*. It has been determined, that a woman may have any trial, except those by *poison* and by *water*.

Certain months and days also are limited in the *Mitácshera* for the different species of ordeal; as *Agrah*an, *Paush*, *Mágh*, *P'hálgun*, *Sráwan*, and *B'hádr*, for that by *fire*; *A'swin*, *Cártic*, *Jaisht*, and *A'shađh*, for that by *water*; *Paush*, *Mágh*, and *P'hálgun*, for that by *poison*; and regularly there should be no *water-ordeal* on the *Astemi*, or *eighth*; the *Cheturdaśi*, or *fourteenth* day of the new or full moon, in the intercalary month, in the month of *B'hádar*; on *Sanaishcher*, or *Saturday*; and on *Mangal*, or *Tuesday*: but, whenever the magistrate decides that there shall be an ordeal, the regular appointment of months and days needs not be regarded.

The *Mitácshera* contains also the following distinctions. In cases of theft or fraud to the amount of a *hundred* gold mohrs, the trial by *poison* is proper; if *eighty* mohrs be stolen, the suspected person may be tried by *fire*; if *forty*, by the *balance*; if from *thirty* to *ten*, by the *image-water*; if *two* only, by *rice*.

An inspired legislator, named *Cátyáyana*, was of opinion, that though a theft or fraud could be proved by witnesses, the party accused might be tried by ordeal. He says too, that, where a thousand *pana's* are stolen, or fraudulently with-held, the proper trial is by *poison*; where *seven hundred and fifty*, by *fire*; where *six hundred and sixty-six*, and a fraction, by *water*; where *five hundred*,



by the *balance*; where *four hundred*, by *hot oil*; where *three hundred*, by *rice*; where an *hundred and fifty*, by the *Cósha*; and where *one hundred*, by the *dharmárch*, or images of silver and iron.

The mode of conducting the ordeal by *red-hot balls*, or *heads of spears*, is thus particularly described in the Commentary on *Yágyawelcya*.

At daybreak the place where the ceremony is to be performed, is cleared and washed in the customary form; and at sun-rise the *Pandits*, having paid their adoration to *Ganésa*, the God of Wisdom, draw nine circles on the ground with cow-dung, at intervals of sixteen fingers; each circle containing sixteen fingers of each, but the ninth either smaller or larger than the rest. Then they worship the deities in the mode prescribed by the *Sástra*, present oblations to the fire, and, having a second time worshipped the Gods, read the appointed *mentra's*. The person to be tried then performs an ablution, puts on moist clothes, and, turning his face to the east, stands in the *first* ring, with both his hands fixed in his girdle. After this the presiding magistrate and *Pandits* order him to rub some rice in the husk between his hands, which they carefully inspect; and, if the scar of a former wound, a mole, or other mark, appear on either of them, they stain it with a dye, that, after trial, it may be distinguished from any new mark. They next order him to hold both his hands open and close together; and, having put into them seven leaves of the trembling tree, or *pippal*, seven of the *sami*, or *jend*, seven blades of *darbha* grass, a little barley moistened with curds, and a few flowers, they fasten the leaves on his hand with seven threads of raw cotton. The *Pandits* then read the *ślócas* which are appointed for the occasion;



occasion ; and, having written a state of the case, and the point in issue, on a Palmyra-leaf, together with the *mentra* prescribed in the *Véda*, they tie the leaf on the head of the accused. All being prepared, they heat an iron ball, or the head of a lance, weighing two *sér* and a half, or five *pounds*, and throw it into water ; they heat it again, and again cool it in the same manner. The third time they keep it in the fire till it is red hot ; then they make the person accused stand in the first circle ; and, having taken the iron from the fire, and read the usual incantation over it, the *Pandits* place it with tongs in his hands. He must step gradually from circle to circle, his feet being constantly within one of them, and when he has reached the *eighth*, he must throw the iron into the *ninth*, so as to burn some grass, which must be left in it for that purpose. This being performed, the magistrate and *Pandits* again command him to rub some rice in the husk between both his hands, which they afterwards examine ; and if any mark of burning appear on either of them, he is convicted ; if not, his innocence is considered as proved. If his hand shake through fear, and by his trembling any other part of his body is burned, his veracity remains unimpeached ; but, if he let the iron drop before he reach the *eighth* circle, and doubt arise in the minds of the spectators whether it had burned him, he must repeat the whole ceremony from the beginning.

In the year of the *Messiah* 1783, a man was tried by the *hot ball* at *Benáres*, in the presence of me *Ali Ibráhim Khán*, on the following occasion. A man had accused one *Sancar* of larceny, who pleaded that he was not guilty ; and as the theft could not be proved by legal evidence, the trial by *fire-ordeal* was tendered to the appellee, and accepted by him. This well-wisher to mankind advised the learned magistrates and *Pandits*, to prevent the decision of the question by a mode not



conformable to the practice of the Company's Government, and recommended an oath by the water of the *Ganges*; and the leaves of *tulasi*, in a little vessel of brass, or by the book *Herivanfa*, or the stone *Sálgrám*, or by the hallowed ponds or basins; all which oaths are used at *Benâres*. When the parties obstinately refused to try the issue by any one of the modes recommended, and insisted on a trial by the hot ball, the magistrates and *Pandits* of the court were ordered to gratify their wishes; and, setting aside those forms of trial in which there could be only a distant fear of death, or loss of property, as the just punishment of perjury by the sure, yet slow, judgment of heaven, to perform the ceremony of ordeal agreeably to the *Dherma Sástra*: but it was not till after mature deliberation for four months, that a regular mandate issued for trial by the red-hot ball; and this was at length granted for four reasons: first, because there was no other way of condemning or absolving the person accused; secondly, because both parties were *Hindus*, and this mode of trial was specially appointed in the *Dherma Sástra* by the ancient law-givers; thirdly, because this ordeal is practised in the dominions of the *Hindu Rájás*; and fourthly, because it might be useful to inquire how it was possible for the heat of fire to be resisted, and for the hand that held it to avoid being burned. An order was accordingly sent to the *Pandits* of the court, and of *Benâres*, to this effect: “ Since the parties accusing and accused are both *Hindus*, and will not consent to any trial but that by the hot ball, let the ordeal desired be duly performed in the manner prescribed by the *Mitácsherá*, or Commentary on *Yágyawalcyá*.”

When preparations were made for the trial, this well-wisher to mankind, attended by all the learned professors, by the officers of the court, the *Sipáhis* of Captain *Hogan's* battalion, and many inhabitants of *Benâres*,

went

went to the place prepared, and endeavoured to dissuade the appellor from requiring the accused to be tried by fire, adding "if his hand be not burned, you shall certainly be imprisoned." The accuser, not deterred by this menace, persisted in demanding the trial. The ceremony, therefore, was thus conducted in the presence of me, *Ali Ibráhim Khán*.

The *Pandits* of the court and the city, having worshipped the God of *Knowledge*, and presented their oblation of clarified butter to the fire, formed nine circles of cow-dung on the ground; and, having bathed the appellee in the *Ganges*, brought him with his clothes wet; when, to remove all suspicion of deceit, they washed his hands with pure water: then, having written a state of the case, and the words of the *mentra*, on a Palmyra-leaf, they tied it on his head; and put into his hands, which they opened and joined together, seven leaves of *pippal*, seven of *jend*, seven blades of *darbha* grass, a few flowers, and some barley moistened with curds, which they fastened with seven threads of raw white cotton. After this they made the iron ball red hot, and, taking it up with tongs, placed it in his hands. He walked with it, step by step, the space of three *gaz* and a half, through each of the seven intermediate rings, and threw the ball into the *ninth*, where it burnt the grass that had been left in it. He next, to prove his veracity, rubbed some rice in the husk between his hands; which were afterwards examined, and were so far from being burned, that not even a blister was raised on either of them. Since it is the nature of fire to burn, the officers of the court, and people of *Benáres*, near five hundred of whom attended the ceremony, were astonished at the event; and this well-wisher to mankind was perfectly amazed. It occurred to his weak apprehension, that probably the fresh leaves, and other things, which, as it has been mentioned, were placed on the hands of the accused, had



had prevented their being burned; besides that the time was but short between his taking the ball and throwing it down; yet it is positively declared in the *Dherma Sástra*, and in the written opinions of the most respectable *Pandits*, that the hand of a man who speaks truth cannot be burned; and *Ali Ibráhim Khán* certainly saw with his own eyes, as many others also saw with theirs, that the hands of the appellee in this cause were unhurt by the fire. He was consequently discharged. But, that men might in future be deterred from demanding the trial by ordeal, the appellor was committed for a week. After all, if such a trial could be seen once or twice by several intelligent men, acquainted with natural philosophy, they might be able to assign the true reason why a man's hand may be burned in some cases, and not in others.

Ordeal by the vessel of *hot oil*, according to the Comment on the *Dherma Sástra*, is thus performed. The ground appointed for the trial is cleared, and rubbed with cow-dung; and the next day, at sun-rise, the *Pandit* worships *Ganésa*, presents his oblations, and pays adoration to other deities, conformably to the *Sástra*; then, having read the incantation prescribed, he places a round pan of gold, silver, copper, iron, or clay, with a diameter of sixteen fingers, and four fingers deep; and throws into it one *sér*, or eighty *sicca* weight, of clarified butter, or oil of *sesamum*. After this a ring of gold, or silver, or iron, is cleaned, and washed with water, and cast into the oil, which they proceed to heat; and when it is very hot, put into it a fresh leaf of *pippala*, or of *bilwa*: when the leaf is burned, the oil is known to be sufficiently hot. Then, having pronounced a *mentra* over the oil, they order the party accused to take the ring out of the pan; and if he take it out without being burned, or without a blister on his hand, his innocence is considered as proved; if not, his guilt.

A *Bráhmaṇ*,



A *Bráhma*n, named *Rishíswara Bhatta*, accused one *Rámdayál*, a linen painter, of having stolen his goods. *Rámdayál* pleaded not guilty; and, after much altercation, consented to be tried, as it had been proposed, by the vessel of oil. This well-wisher to mankind advised the *Pandits* of the court to prevent, if possible, that mode of trial; but since the parties insisted on it, an ordeal by hot oil, according to the *Sástra*, was awarded for the same reasons which prevailed in regard to the trial by the ball. The *Pandits*, who assisted at the ceremony, were *Bhíshma Bhatta*, *Nánápát'hac*, *Maniráma Pát'haca*, *Meniráma Bhatta*, *Siva*, *Anantráma Bhatta*, *Cripáráma*, *Vishnuheri*, *Crishnachandra*, *Ráméndra*, *Góvindaráma*, *Hericrishna Bhatta*, *Cálidása*: The three last were *Pandits* of the court. When *Ganésa* had been worshipped, and the *hóma* presented, according to the *Sástra*, they sent for this well-wisher to mankind; who, attended by the two *Dáróghas* of the *Déváni* and *Faujdári* courts, the *Cotwál* of the town, the other officers of the court, and most of the inhabitants of *Benáres*, went to the place of trial; where he laboured to dissuade *Rámdayál*, and his father, from submitting to the ordeal; and apprised them, that if the hand of the accused should be burned, he would be compelled to pay the value of the goods stolen, and his character would be disgraced in every company. *Rámdayál* would not desist: he thrust his hand into the vessel, and was burned. The opinion of the *Pandits* was then taken; and they were unanimous, that, by the burning of his hand, his guilt was established, and he bound to pay *Rishíswara Bhatta* the price of what he had stolen; but if the sum exceeded five hundred *ashrafi*'s, his hand must be cut off by an express law in the *Sástra*; and a mulct also must be imposed on him according to his circumstances.

The chief magistrate, therefore, caused *Rámdayál* to pay *Rishíswara* seven hundred rupees in return for the



the goods which had been stolen ; but, as amercements in such cases are not usual in the courts of judicature at *Benáres*, the mulct was remitted, and the prisoner discharged.

The record of this conviction was transmitted to *Calcutta* in the year of the *Messiah* 1783; and in the month of *April*, 1784, the Governor-General, *Imádu'd-daúlah Jeládet Fáng Beháder*, having seen the preceding account of trials by ordeal, put many questions concerning the meaning of *Sanscrit* words, and the cases here reported; to which he received respectful answers. He first desired to know the precise meaning of *hóma*, and was informed that it meant the oblations made to please the deities, and comprised a variety of things. Thus in the *agni hóma*, they throw into the fire several sorts of wood and grass, as *palás* wood, *c'hadira* wood, *raēta chandan*, or red sandal, *pippal-wood sami*, and *cusha* grass, together with some sorts of grain, fruit, and other ingredients, as *black sesamum*, *barley*, *rice*, *sugar-cane*, *clarified butter*, *almonds*, *dates*, and *gúgal*, or *bdellium*. To his next question, “how many species of *hóma* there “were,” it was answered, that different species were adopted on different occasions: but that, in the ordeals by hot iron, and hot oil, the same sort of oblation was used. When he desired to know the meaning of the word *mentra*, he was respectfully told, that in the language of the *Pandits* there were three such words, *mentra*, *yantra*, and *tantra*; that the *first* meant a passage from one of the *Védas*, in which the names of certain deities occurred; the second, a scheme of figures, which they write with a belief that their wishes will be accomplished by it; and the third, a medical preparation, by the use of which all injuries may be avoided; for they are said to rub it on their hands, and afterwards to touch red-hot iron without being burned. He then asked how much barley, moistened with curds, was put into the hands of the accused person; and the answer was, *nine grains*.

His

His other questions were thus answered : “ That the leaves of *pippala* were spread about in the hands of the accused, not heaped one above another ; that the man, who performed the ordeal, was not much agitated, but seemed in full possession of his faculties ; that the person tried by hot oil was at first afraid, but persisted, after he was burned, in denying the theft ; nevertheless, as he previously had entered into a written agreement, that, if his hand should be hurt, he would pay the value of the goods, the magistrate for that reason thought himself justified in compelling payment ; that, when the before mentioned ingredients of the *hóma* were thrown into the fire, the *Pandits*, sitting round the hearth, sung the *Slócas* prescribed in the *Sástra*. That the form of the hearth is established in the *Véda* and in the *Dherma Sástra* ; and this fire-place is also called *Védi* ; that, for the smaller oblations, they raise a little ground for the hearth, and kindle fire on it ; for the higher oblations, they sink the ground, to receive the fire where they perform the *hóma*, and this sacred hearth they call *cunda*.” The Governor then asked, why the trials by fire, by the hot ball, and the vessel of oil, if there be no essential difference between them, are not all called fire-ordeals ; and it was humbly answered, that according to some *Pandits*, they were all three different ; whilst others insisted, that the trial by fire was distinct from that by the vessel, though the trial by the hot ball, and the head of a lance, was the same ; but that, in the apprehension of his respectful servant, they were all ordeals by fire.



THE  
INDIAN LAW OF ORDEAL,

*Verbally translated from Yágyawalcya.*

1. **T**HE balance, fire, water, poison, the idol—  
These are the ordeals used below for the proof of innocence, when the accusations are heavy, and when the accuser offers to hazard a mulct, (if he should fail.)

2. Or one party may be tried, if he please, by ordeal, and the other must then risque an amercement. But the trial may take place even without any wager, if the crime committed be injurious to the prince.

3. The sovereign, having summoned the accused, while his clothes are yet moist from bathing, at sunrise, before he has broken his fast, shall cause all trials by ordeal to be conducted in the presence of *Bráhmans*.

4. The balance is for women, children, old men, the blind, the lame, *Bráhmans*; and the sick; for the *Súdra*, fire or water, or seven barley-corns of poison.

5. Unless the loss of the accuser amount to a thousand pieces of silver, the accused must not be tried by the red-hot ball, nor by poison, nor by the scales; but, if the offence be against the king, or if the crime be heinous, he must acquit himself by one of those trials in all cases.

6. He

6. He who has recourse to the balance, must be attended by persons experienced in weighing, and go down into one scale, with an equal weight placed in the other, and a groove (with water in it) marked on the beam.

7. "Thou, O balance, art the mansion of truth; thou wast anciently contrived by deities: declare the truth, therefore, O giver of success, and clear me from all suspicion.

8. "If I am guilty, O venerable as my own mother, then sink me down; but if innocent, raise me aloft." Thus shall he address the balance.

9. If he sink, he is convicted, or if the scales be broken; but if the string be not broken, and he rise aloft, he must be acquitted.

10. On the trial by fire, let both hands of the accused be rubbed with rice in the husk, and well examined; then let seven leaves of the *Afwatt'ha* (the religious fig-tree) be placed on them, and bound with seven threads.

11. "Thou, O fire, pervadest all beings; O cause of purity, who givest evidence of virtue and of sin, declare the truth in this my hand."

12. When he has pronounced this, the priest shall place in both hands an iron ball, red hot, and weighing fifty \* *pala's*.

13. Having taken it, he shall step gradually into seven circles, each with a diameter of sixteen fingers, and separated from the next by the same space.

14. If,

\* A *pala* is four *carsha's*, and a *carsha*, eighty *ractica's*, or seeds of the *Gunja* creeper, each weighing above a grain and a quarter, or correctly, 1gr. 5-16ths.



14. If, having cast away the hot ball, he shall again have his hands rubbed with rice in the husk, and shall show them unburned, he will prove his innocence. Should the iron fall during the trial, or should a doubt arise (on the regularity of the proceedings) he must be tried again.

15. "Preserve me, O, *Varuna*, by declaring the truth." Thus having invoked the God of Waters, the accused shall plunge his head into the river or pool, and hold both thighs of a man, who shall stand in it up to his navel.

16. A swift runner shall then hasten to fetch an arrow shot at the moment of his plunging; and if, while the runner is gone, the priest shall see the head of the accused under water, he must be discharged as innocent.

17. "Thou, O poison, art the child of *Brahmá*, steadfast in justice and in truth: clear me then from this heavy charge, and, if I have spoken truly, become nectar to me."

18. Saying this, he shall swallow the poison *Sárnga*, from the tree which grows on the mountain *Himálaya*; and if he digest it without any inflammation, the prince shall pronounce him guiltless.

19. Or the priest shall perform rites to the image of some tremendous deity, and, having bathed the idol, shall make the accused to drink three handfuls of the water that has dropped from it:

20. If, in fourteen days after, he suffer no dreadful calamity from the act of the deity, or of the king, he must indubitably be acquitted.

XXIV.

THE

SECOND ANNIVERSARY DISCOURSE,

Delivered 24th FEBRUARY, 1785,

BY

THE PRESIDENT.

GENTLEMEN,

**I**F the Deity of the *Hindus*, by whom all their just requests are believed to be granted with singular indulgence, had proposed last year to gratify my warmest wishes, I could have desired nothing more ardently than the success of your Institution; because I can desire nothing in preference to the general good, which your plan seems calculated to promote, by bringing to light many useful and interesting tracts, which, being too short for separate publication, might lie many years concealed, or, perhaps, irrecoverably perish. My wishes are accomplished, without an invocation to *Cámadhénu*; and your Society, having already passed its infant state, is advancing to maturity with every mark of a healthy and robust constitution. When I reflect, indeed, on the variety of subjects which have been discussed before you, concerning the history, laws, manners, arts, and antiquities, of *Asia*, I am unable to decide whether my pleasure or my surprise be the greater; for I will not dissemble, that your progress has far exceeded my expectations; and, though we must seriously deplore the  
loss



loss of those excellent men who have lately departed from this capital, yet there is a prospect still of large contributions to your stock of *Asiatick* learning, which, I am persuaded, will continually increase. My late journey to *Benâres* has enabled me to assure you, that many of your members, who reside at a distance, employ a part of their leisure in preparing additions to your archives; and, unless I am too sanguine, you will soon receive light from them on several topicks entirely new in the republick of letters.

It was principally with a design to open sources of such information, that I long had meditated an expedition up the *Ganges* during the suspension of my business; but, although I had the satisfaction of visiting two ancient seats of *Hindu* superstition and literature, yet, illness having detained me a considerable time in the way, it was not in my power to continue in them long enough to pursue my inquiries; and I left them, as *Æneas* is feigned to have left the shades, when his guide made him recollect *the swift flight of irrevocable time*, with a curiosity raised to the height, and a regret not easily to be described.

Whoever travels in *Asia*, especially if he be conversant with the literature of the countries through which he passes, must naturally remark the superiority of *European* talents. The observation, indeed, is at least as old as *Alexander*: And though we cannot agree with the sage preceptor of that ambitious Prince, that “the *Asiatics* are born to be slaves,” yet the *Athenian* poet seems perfectly in the right, when he represents *Europe* as a *sovereign Princess*, and *Asia* as her *Hand-maid*: But, if the mistress be transcendently majestick, it cannot be denied that the attendant has many beauties,

ties, and some advantages peculiar to herself. The ancients were accustomed to pronounce *panegyrics* on their own countrymen at the expence of all other nations; with a political view, perhaps, of stimulating them by praise, and exciting them to still greater exertions; but such arts are here unnecessary; nor would they, indeed, become a Society, who seek nothing but truth unadorned by rhetoric; and, although we must be conscious of our superior advancement in all kinds of useful knowledge, yet we ought not therefore to condemn the people of *Asia*, from whose researches into nature, works of art, and inventions of fancy, many valuable hints may be derived for our own improvement and advantage. If that, indeed, were not the principal object of your Institution, little else could arise from it, but the mere gratification of curiosity; and I should not receive so much delight from the humble share which you have allowed me to take in promoting it.

To form an exact parallel between the works and actions of the Western and Eastern Worlds, would require a tract of no inconsiderable length; but we may decide, on the whole, that reason and taste are the grand prerogatives of *European* minds, while the *Asiatics* have soared to loftier heights in the sphere of imagination. The civil history of their vast empires, and of *India* in particular, must be highly interesting to our common country; but we have a still nearer interest in knowing all former modes of ruling *these inestimable provinces*, on the prosperity of which so much of our national welfare and individual benefit seems to depend. A minute *geographical* knowledge, not only of *Bengal* and *Bahar*, but, for evident reasons, of *all the kingdoms bordering on them*, is closely connected with an account of their many revolutions: but the *natural* productions of these territories, especially in the *vegetable* and *mineral* systems, are



are momentous objects of research to an *imperial*, but, which is a character of equal dignity, a *commercial*, people.

If *botany* may be described by metaphors drawn from the science itself, we may justly pronounce a minute acquaintance with *plants*, their *classes*, *orders*, *kinds*, and *species*, to be its *flowers*, which can only produce *fruit* by an application of that knowledge to the purposes of life, particularly to *diet*, by which diseases may be avoided; and to *medicine*, by which they may be remedied. For the improvement of the last mentioned art, than which none surely can be more beneficial to mankind, the virtues of *minerals* also should be accurately known. So highly has medical skill been prized by the ancient *Indians*, that one of the *fourteen Retna's*, or *precious things*, which their gods are believed to have produced by churning the ocean with the mountain *Mandara*, was a *learned physician*. What their old books contain on this subject we ought certainly to discover, and that without loss of time; lest the venerable, but abstruse, language in which they are composed, should cease to be perfectly intelligible, even to the best educated natives, through a want of powerful invitation to study it. *Bernier*, who was himself of the faculty, mentions approved medical books in *San scrit*, and cites a few aphorisms, which appear judicious and rational; but we can expect nothing so important from the works of *Hindu* or *Muselman* physicians, as the knowledge, which experience must have given them, of *simple* medicines. I have seen an *Indian* prescription of *fifty-four*, and another of *fifty-six*, ingredients; but such compositions are always to be suspected, since the effect of one ingredient may destroy that of another; and it were better to find certain accounts of a single leaf or berry, than to be acquainted with the most elaborate compounds, unless they too have been proved by a multitude

tude of successful experiments. The noble deobstruent oil extracted from the *eranda* nut, the whole family of *Balsams*, the incomparable stomachick root from *Columbo*, the fine astringent ridiculously called *Japan* earth, but in truth produced by the decoction of an *Indian* plant, have long been used in *Asia*; and who can foretel what glorious discoveries of other oils, roots, and salutary juices, may be made by your Society? If it be doubtful whether the *Peruvian* bark be *always* efficacious in this country, its place may, perhaps, be supplied by some indigenous vegetable equally antiseptic, and more congenial to the climate. Whether any treatises on *Agriculture* have been written by experienced natives of these provinces, I am not yet informed; but since the court of *Spain* expect to find useful remarks in an *Arabick* tract preserved in the *Escorial*, on the cultivation of land in that kingdom, we should inquire for similar compositions, and examine the contents of such as we can procure.

The sublime science of Chemistry, which I was on the point of calling *divine*, must be added as a key to the richest treasuries of nature; and it is impossible to foresee how greatly it may improve our *manufactures*, especially if it can fix those brilliant *dyes*, which want nothing of perfect beauty, but a longer continuance of their splendor; or how far it may lead to new methods of *fluxing and compounding metals*, which the *Indians*, as well as the *Chinese*, are thought to have practised in higher perfection than ourselves.

In those elegant arts which are called *fine* and *liberal*, though of less general utility than the labours of the mechanick, it is really wonderful how much a single nation has excelled the whole world: I mean the ancient *Greeks*, whose *sculpture*, of which we have exquisite remains,



mains, both on gems and on marble, no modern tool can equal; whose *architecture* we can only imitate at a servile distance, but are unable to make one addition to it, without destroying its graceful simplicity; whose *poetry* still delights us in youth, and amuses us at a maturer age; and of whose *painting* and *musick*, we have the concurrent relations of so many grave authors, that it would be strange incredulity to doubt their excellence. *Painting*, as an art belonging to the powers of the imagination, or what is commonly called *genius*, appears to be yet in its infancy among the people of the east: but the *Hindu* system of *musick* has, I believe, been formed on truer principles than our own; and all the skill of the native composers is directed to the great object of their art, *the natural expression of strong passions*, to which *melody*, indeed, is often sacrificed; though some of their tunes are pleasing even to an *European* ear. Nearly the same may be truly asserted of the *Arabian* or *Persian* system; and, by a correct explanation of the best books on that subject, much of the old *Grecian* theory may probably be recovered.

The *poetical* works of the *Arabs* and *Persians*, which differ surprisingly in their style and form, are here pretty generally known; and though tastes, concerning which there can be no disputing, are divided in regard to their merit, yet we may safely say of them, what *Abulfazl* pronounces of the *Mahábhárat*, that, “although they abound with extravagant images and descriptions, they are in the highest degree entertaining and instructive.” Poets of the greatest genius, *Pindar*, *Æschylus*, *Dante*, *Petrarch*, *Shakespeare*, *Spenser*, have most abounded in images not far from the brink of absurdity; but if their luxuriant fancies, or those of *Abulola*, *Firdausi*, *Nizámi*, were pruned away at the hazard of their strength and majesty, we should lose many pleasures by the amputation. If we may form a  
just

just opinion of the *Sanscrit* poetry from the specimens already exhibited, (though we can only judge perfectly by consulting the originals,) we cannot but thirst for the whole work of *Vyása*, with which a member of our Society, whose presence deters me from saying more of him, will in due time gratify the publick. The poetry of *Mathurà*, which is the *Parnassian* land of the *Hindus*, has a softer and less elevated strain; but, since the inhabitants of the districts near *Agra*, and principally of the *Duab*, are said to surpass all other *Indians* in eloquence, and to have composed many agreeable tales and love-songs, which are still extant, the *Bhāshā*, or *vernacular idiom* of *Vraja*, in which they are written, should not be neglected. No specimens of genuine *oratory* can be expected from nations, among whom the form of government precludes even the idea of *popular eloquence*; but the art of writing, in elegant and modulated periods, has been cultivated in *Asia* from the earliest ages; the *Vēda*'s, as well as the *Alkōran*, are written in measured prose; and the compositions of *Isocrates* are not more highly polished than those of the best *Arabian* and *Persian* authors.

Of the *Hindu* and *Muselman* architecture there are yet many noble remains in *Bahar*, and some in the vicinity of *Malda*; nor am I unwilling to believe, that even those ruins, of which you will, I trust, be presented with correct delineations, may furnish our own architects with new ideas of beauty and sublimity.

Permit me now to add a few words on the *sciences*, properly so named; in which it must be admitted, that the *Asiatics*, if compared with our Western nations, are mere children. One of the most sagacious men in this age, who continues, I hope, to improve and adorn it, *Samuel Johnson*, remarked in my hearing, that, “if



“*Newton* had flourished in ancient *Greece*, he would “ have been worshipped as a divinity.” How zealously then would he be adored in *Hindustan*, if his incomparable writings could be read and comprehended by the *Pandits* of *Cashmír* or *Benáres* ! I have seen a mathematical book in *Sanscrit* of the highest antiquity ; but soon perceived, from the diagrams, that it contained only simple elements. There may, indeed, have been in the favourable atmosphere of *Asia*, some diligent observers of the celestial bodies ; and such observations as are recorded should indisputably be made publick ; but let us not expect any new *methods*, or the analysis of new *curves*, from the geometricians of *Iran*, *Turkistan*, or *India*. Could the works of *Archimedes*, the *Newton* of *Sicily*, be restored to their genuine purity by the help of *Arabick* versions, we might then have reason to triumph on the success of our scientific inquiries ; or could the successive improvements and various rules of *algebra*, be traced through *Arabian* channels, to which *Cardan* boasted that he had access, the modern history of *Mathematicks* would receive considerable illustration.

The jurisprudence of the *Hindus* and *Muselmans* will produce more immediate advantage ; and if some standard *law-tracts* were accurately translated from the *Sanscrit* and *Arabick*, we might hope in time to see so complete a Digest of *Indian* Laws, that all disputes among the natives might be decided without *uncertainty*, which is, in truth, a disgrace, though satirically called a *glory*, to the forensick science.

All these objects of inquiry must appear to you, Gentlemen, in so strong a light, that bare intimations of them will be sufficient : nor is it necessary to make use of *emulation* as an incentive to an ardent pursuit of them : yet I cannot forbear expressing a wish that the  
activity

activity of the *French* in the same pursuits may not be superior to ours; and that the researches of *M. Sonnerat*, whom the court of *Versailles* employed for seven years in these climates, merely to collect such materials as we are seeking, may kindle, instead of abating, our own curiosity and zeal. If you assent, as I flatter myself you do, to these opinions, you will also concur in promoting the object of them; and a few ideas having presented themselves to my mind, I presume to lay them before you, with an entire submission to your judgment.

No contributions, except those of the literary kind, will be requisite for the support of the Society: but if each of us were occasionally to contribute a succinct description of such manuscripts as he had perused, or inspected, with their dates, and the names of their owners, and to propose for solution, such *questions* as had occurred to him concerning *Asiatick* Art, Science, and History, natural or civil, we should possess without labour, and almost by imperceptible degrees, a fuller catalogue of Oriental Books than has hitherto been exhibited; and our correspondents should be apprised of those points to which we chiefly direct our investigations. Much may, I am confident, be expected from the communications of *learned natives*, whether lawyers, physicians, or private scholars, who would eagerly, on the first invitation, send us their *Mekâmât* and *Risâlahs* on a variety of subjects; some for the sake of advancing general knowledge; but most of them from a desire, neither uncommon nor unreasonable, of attracting notice, and recommending themselves to favour. With a view to avail ourselves of this disposition, and to bring their latent science under our inspection, it might be advisable to print and circulate a short memorial, in *Persian* and *Hindi*, setting forth, in a style accommodated to their own habits and prejudices,



judices, the design of our institution. Nor would it be improper hereafter, to give a medal annually, with inscriptions in *Persian* on one side, and on the reverse in *Sanscrit*, as the prize of merit, to the writer of the best essay or dissertation. To instruct others is the prescribed duty of learned *Bráhmans*; and if they be men of substance, without reward; but they would all be flattered with an honorary mark of distinction; and the *Mahomedans* have not only the permission, but the positive command of their law-giver, *to search for learning even in the remotest parts of the globe*. It were superfluous to suggest, with how much correctness and facility their compositions might be translated for our use, since their languages are now more generally and perfectly understood than they have ever been by any nation of *Europe*.

I have detained you, I fear, too long by this address; though it has been my endeavour to reconcile comprehensiveness with brevity. The subjects, which I have lightly sketched, would be found, if minutely examined, to be inexhaustible; and, since no limits can be set to your researches, but the boundaries of *Asia* itself, I may not improperly conclude with wishing for your Society, what the Commentator on the Laws prays for the constitution of our country, that *it may be perpetual*.

XXV.

THE

THIRD ANNIVERSARY DISCOURSE,

Delivered 2 FEBRUARY, 1786,

BY

THE PRESIDENT.

IN the former discourses which I had the honour of addressing to you, Gentlemen, on the *institution* and *objects* of our Society, I confined myself purposely to general topicks; giving in the first, a distant prospect of the vast career on which we were entering; and, in the second, exhibiting a more diffuse, but still superficial, sketch of the various discoveries in History, Science, and Art, which we might justly expect from our inquiries into the Literature of *Asia*. I now propose to fill up that outline so comprehensively as to omit nothing essential, yet so concisely as to avoid being tedious; and, if the state of my health shall suffer me to continue long enough in this climate, it is my design, with your permission, to prepare for our annual meetings, a series of short dissertations, unconnected in their titles and subjects, but all tending to a common point of no small importance in the pursuit of interesting truths.

Of all the works which have been published in our own age, or, perhaps, in any other, on the History of the  
 3 Ancient



Ancient World, and *the population of this habitable globe*, that of Mr. *Jacob Bryant*, whom I name with reverence and affection, has the best claim to the praise of deep erudition ingeniously applied; and new theories, happily illustrated by an assemblage of numberless converging rays from a most extensive circumference: it falls, nevertheless, as every human work must fall, short of perfection; and the least satisfactory part of it seems to be that which relates to the derivation of words from *Asiatick* languages. Etymology has, no doubt, some use in historical researches; but it is a medium of proof so very fallacious, that, where it elucidates one fact, it obscures a thousand; and more frequently borders on the ridiculous, than leads to any solid conclusion. It rarely carries with it any *internal* power of conviction, from a resemblance of sounds or similarity of letters; yet often, where it is wholly unassisted by those advantages, it may be indisputably proved by *extrinsick* evidence. We know *à posteriori*, that both *fitz* and *hijo*, by the nature of two several dialects, are derived from *filius*; that *uncle* comes from *avus*, and *stranger* from *extra*; that *jour* is deducible, through the *Italian*, from *dies*: and *rossignol* from *luscinia*, or the *singer in groves*; that *sciuro*, *écureuil*, and *squirrel*, are compounded of two *Greek* words descriptive of the animal; which etymologies, though they could not have been demonstrated *à priori*, might serve to confirm, if any such confirmation were necessary, the proofs of a connection between the members of one great empire; but, when we derive our *hanger*, or *short pendant sword*, from the *Persian*, because ignorant travellers thus mis-spell the word *khanjar*, which, in truth, means a different weapon, or *sandalwood* from the *Greek*, because we suppose that *sandals* were sometimes made of it, we gain no ground in proving the affinity of nations, and only weaken arguments which might otherwise be firmly supported. That *Cús*, then, or, as it certainly is written in one ancient dialect, *Cút*, and in others, probably, *Cás*, enters into the com-

position of many proper names, we may very reasonably believe; and that *Algeziras* takes its name from the *Arabick* word for an *island*, cannot be doubted; but, when we are told from *Europe*, that places and provinces in *India* were clearly denominated from those words, we cannot but observe, in the first instance, that the town in which we now are assembled is properly written and pronounced *Calicàtà*; that both *Cátà* and *Cút* unquestionably mean *places of strength*, or, in general, any *inclosures*; and that *Gujeràt* is at least as remote from *Fezirah* in sound as it is in situation.

Another exception (and a third could hardly be discovered by any candid criticism) to the *Analysis of Ancient Mythology*, is, that the *method* of reasoning, and arrangement of topics, adopted in that learned work, are not quite agreeable to the title, but almost wholly *synthetical*; and, though *synthesis* may be the better mode in pure *science*, where the principles are undeniable, yet it seems less calculated to give complete satisfaction in *historical* disquisitions, where every postulatam will, perhaps, be refused, and every definition controverted. This may seem a slight objection; but the subject is in itself so interesting, and the full conviction of all reasonable men so desirable, that it may not be lost labour to discuss the same or a similar theory in a method purely analytical, and, after beginning with facts of general notoriety, or undisputed evidence, to investigate such truths as are at first unknown, or very imperfectly discerned.

The *five* principal nations who have in different ages divided among themselves, as a kind of inheritance, the vast continent of *Asia*, with the many islands depending on it, are the *Indians*, the *Chinefe*, the *Tartars*, the *Arabs*, and the *Persians*: who they severally were, whence and when



when they came, where they now are settled, and what advantage a more perfect knowledge of them all may bring to our *European* world, will be shown, I trust, in five distinct essays; the last of which will demonstrate the connexion or diversity between them, and solve the great problem, whether they had any common origin, and whether that origin was the same which we generally ascribe to them.

I begin with *India*: not because I find reason to believe it the true center of population, or of knowledge, but because it is the country which we now inhabit, and from which we may best survey the regions around us; as, in popular language, we speak of the *rising* sun, and of his *progress through the Zodiack*, although it had long ago been imagined, and is now demonstrated, that he is himself the center of our planetary system. Let me here premise, that, in all these inquiries concerning the History of *India*, I shall confine my researches downwards to the *Mohammedan* conquests at the beginning of the *eleventh* century, but extend them upwards as high as possible, to the earliest authentic records of the human species.

*India* then, on its most enlarged scale, in which the ancients appear to have understood it, comprises an area of near *forty* degrees on each side, including a space almost as large as all *Europe*; being divided on the west from *Persia* by the *Arachosian* mountains, limited on the east by the *Chinese* part of the farther Peninsula, confined on the north by the wilds of *Tartary*, and extending to the south as far as the isles of *Java*. This trapezium, therefore, comprehends the stupendous hills of *Potyid* or *Tibet*, the beautiful valley of *Cashmír*, and all the domains of the old *Indoscythians*, the countries of *Népál* and *Butánt*, *Cámrúp* or *Asám*, together with *Siam*, *Ava*,  
*Racan*,

*Racan*, and the bordering kingdoms, as far as the *China* of the *Hindus*, or *Sín* of the *Arabian* Geographers; not to mention the whole Western Peninsula, with the celebrated island of *Sinhala*, or *Lion-like Men*, at its southern extremity. By *India*, in short, I mean that whole extent of country in which the primitive religion and languages of the *Hindus* prevail at this day with more or less of their ancient purity, and in which the *Nágarì* letters are still used with more or less deviation from their original form.

The *Hindus* themselves believe their own country, to which they give the vain epithets of *Medhyama*, or *Central*, and *Punyabhúmi*, or the *Land of Virtues*, to have been the portion of *Bharat*, one of *nine* brothers, whose father had the dominion of the whole earth; and they represent the mountains of *Himálaya* as lying to the north; and to the west, those of *Vindhya*, called also *Vindian* by the *Greeks*; beyond which the *Sindhu* runs in several branches to the sea, and meets it nearly opposite to the point of *Dwáracà*, the celebrated seat of their Shepherd God. In the *south-east* they place the great river *Saravatya*; by which they probably mean that of *Ava*, called also *Airávatì* in part of its course, and giving perhaps its ancient name to the gulf of *Sabara*. This domain of *Bharat* they consider as the middle of the *Jambudwípa*, which the *Tibetians* also call the *Land of Zambu*; and the appellation is extremely remarkable; for *Jambu* is the *San scrit* name of a delicate fruit, called *Jáman* by the *Muselmans*, and by us *rose-apple*; but the largest and richest sort is named *Amrita*, or *immortal*; and the *Mythologists* of *Tibet* apply the same word to a celestial tree bearing *ambrosial fruit*, and adjoining to *four* vast rocks, from which as many sacred rivers derive their several streams.

The inhabitants of this extensive tract are described by Mr. *Lord* with great exactness, and with a picturesque



turesque elegance peculiar to our ancient language :  
 “ A people (says he) presented themselves to mine eyes,  
 “ clothed in linen garments, somewhat low descending ;  
 “ of a gesture and garb, as I may say, maidenly, and well  
 “ nigh effeminate ; of a countenance shy, and somewhat  
 “ estranged, yet smiling out a glozed and bashful fami-  
 “ liarity.” Mr. *Orme*, the Historian of *India*, who  
 unites an exquisite taste for every fine art with an accu-  
 rate knowledge of *Asiatick* manners, observes, in his  
 elegant preliminary Dissertation, that this “ country  
 “ has been inhabited, from the earliest antiquity, by a  
 “ people who have no resemblance, either in their figure  
 “ or manner, with any of the nations contiguous to  
 “ them ;” and that, “ although conquerors have esta-  
 “ blished themselves at different times in different parts  
 “ of *India*, yet the original inhabitants have lost very  
 “ little of their original character.” The ancients, in  
 fact, give a description of them, which our early travel-  
 lers confirmed, and our own personal knowledge of  
 them nearly verifies ; as you will perceive from a pas-  
 sage in the Geographical Poem of *Dionysius*, which the  
 Analyst of Ancient Mythology has translated with great  
 spirit :

“ To th’ east a lovely country wide extends,  
 “ *India*, whose borders the wide ocean bounds ;  
 “ On this the sun, new rising from the main,  
 “ Smiles pleas’d, and sheds his early orient beam.  
 “ Th’ inhabitants are swart, and in their locks  
 “ Betray the tints of the dark hyacinth.  
 “ Various their functions ; some the rock explore,  
 “ And from the mine extract the latent gold ;  
 “ Some labour at the woof with cunning skill,  
 “ And manufacture linen ; others shape

“ And

“ And polish iv’ry with the nicest care :  
 “ Many retire to rivers shoal, and plunge  
 “ To seek the beryl flaming in its bed,  
 “ Or glitt’ring di’mond. Oft the jasper’s found  
 “ Green, but diaphanous ; the topaz too,  
 “ Of ray serene and pleasing ; last of all,  
 “ The lovely amethyst, in which combine  
 “ All the mild shades of purple. The rich soil,  
 “ Wash’d by a thousand rivers, from all sides  
 “ Pours on the natives wealth without controul.”

Their sources of wealth are still abundant, even after so many revolutions and conquests : in their manufactures of cotton they still surpass all the world ; and their features have, most probably, remained unaltered since the time of *Dionysius* : nor can we reasonably doubt, how degenerate and abased so ever the *Hindus* may now appear, that in some early age they were splendid in arts and arms, happy in government, wise in legislation, and eminent in various knowledge : but since their civil history, beyond the middle of the *nineteenth* century from the present time, is involved in a cloud of fables, we seem to possess only *four* general media of satisfying our curiosity concerning it ; namely, first, their *Languages* and *Letters* ; secondly, their *Philosophy* and *Religion* ; thirdly, the actual remains of their old *Sculpture* and *Architecture* ; and fourthly, the written memorials of their *Sciences* and *Arts*.

I. It is much to be lamented that neither the *Greeks*, who attended *Alexander* into *India*, nor those who were long connected with it under the *Bactrian* Princes, have left us any means of knowing with accuracy, what vernacular



nacular languages they found on their arrival in this Empire. The *Mohammedans*, we know, heard the people of proper *Hindustan*, or *India* on a limited scale, speaking a *Bhášhá*, or living tongue, of a very singular construction, the purest dialect of which was current in the districts round *Agrá*, and chiefly on the poetical ground of *Mat'hurá*; and this is commonly called the idiom of *Vraja*. Five words in six, perhaps, of this language were derived from the *Sanfcrít*, in which books of religion and science were composed, and which appears to have been formed by an exquisite grammatical arrangement, as the name itself implies, from some unpolished idiom; but the basis of the *Hindustáni*, particularly the inflexions and regimen of verbs, differed as widely from both those tongues, as *Arabick* differs from *Persian*, or *German* from *Greek*. Now the general effect of conquest is to leave the current language of the conquered people unchanged, or very little altered, in its ground-work, but to blend with it a considerable number of exotick names, both for things and for actions; as it has happened in every country, that I can recollect, where the conquerors have not preserved their own tongue unmixed with that of the natives, like the *Turks* in *Greece*, and the *Saxons* in *Britain*; and this analogy might induce us to believe, that the pure *Hindí*, whether of *Tartarian* or *Chaldean* origin, was primeval in Upper *India*, into which the *Sanfcrít* was introduced by conquerors from other kingdoms in some very remote age; for we cannot doubt that the language of the *Véda's* was used in the great extent of country which has before been delineated, as long as the religion of *Brahmá* has prevailed in it.

The *Sanfcrít* language, whatever be its antiquity, is of a wonderful structure; more perfect than the *Greek*, more copious than the *Latin*, and more exquisitely refined than either; yet bearing to both of them a stronger affinity,

affinity, both in the roots of verbs, and in the forms of grammar, than could possibly have been produced by accident; so strong, indeed, that no philologer could examine them all three without believing them to have sprung from some common source, which, perhaps, no longer exists. There is a similar reason, though not quite so forcible, for supposing that both the *Gothick* and the *Celtick*, though blended with a very different idiom, had the same origin with the *Sanscrit*; and the old *Persian* might be added to the same family, if this were the place for discussing any question concerning the antiquities of *Persia*.

The *characters*, in which the languages of *India* were originally written, are called *Nágarì*, from *Nagara*, a city, with the word *Déva* sometimes prefixed, because they are believed to have been taught by the Divinity himself, who prescribed the artificial order of them in a voice from heaven. These letters, with no greater variation in their form, by the change of straight lines to curves, or conversely, than the *Cusick* alphabet has received in its way to *India*, are still adopted in more than twenty kingdoms and states, from the borders of *Cashgar* and *Khoten*, to *Ráma's* Bridge, and from the *Sindhu* to the river of *Siam*. Nor can I help believing, although the polished and elegant *Dévanágarì* may not be so ancient as the monumental characters in the caverns of *Farasandha*, that the square *Chaldiack* letters, in which most *Hebrew* books are copied, were originally the same, or derived from the same prototype, both with the *Indian* and *Arabian* characters. That the *Phenician*, from which the *Greek* and *Roman* alphabets were formed by various changes and inversions, had a similar origin, there can be little doubt: and the inscriptions at *Canárah*, of which you now possess a most accurate copy, seem to be compounded of *Nágarì* and *Ethiopick* letters, which bear a close relation to each other,



other, both in the mode of writing from the left hand, and in the singular manner of connecting the vowels with the consonants. These remarks may favour an opinion entertained by many, that all the symbols of *sound*, which at first, probably, were only rude outlines of the different organs of speech, had a common origin. The symbols of *ideas*, now used in *China* and *Japan*, and formerly, perhaps, in *Egypt* and *Mexico*, are quite of a distinct nature; but it is very remarkable, that the order of *sounds* in the *Chinese* grammars corresponds nearly with that observed in *Tibet*, and hardly differs from that which the *Hindus* consider as the invention of their Gods.

II. Of the *Indian* Religion and Philosophy I shall here say but little; because a full account of each would require a separate volume. It will be sufficient in this dissertation to assume, what might be proved beyond controversy, that we now live among the adorers of those very Deities who were worshipped under different names in old *Greece* and *Italy*; and among the professors of those philosophical tenets, which the *Ionick* and *Attick* writers illustrated with all the beauties of their melodious language. On one hand we see the trident of *Neptune*, the eagle of *Jupiter*, the satyrs of *Bacchus*, the bow of *Cupid*, and the chariot of the *Sun*; on another we hear the cymbals of *Rhea*, the songs of the *Muses*, and the pastoral tales of *Apollo* *Nomius*. In more retired scenes, in groves, and in seminaries of learning, we may perceive the *Bráhmans*, and the *Sarmanes*, mentioned by *Clemens*, disputing in the forms of *logick*, or discoursing on the vanity of human enjoyments, on the immortality of the soul, her emanation from the eternal mind, her debasement, wanderings, and final union with her source. The *six* philosophical schools, whose principles are explained in the *Dersana Sástra*, comprise all the metaphysics,



metaphysics of the old *Academy*, the *Stoa*, the *Lyceum*; nor is it possible to read the *Vedānta*, or the many fine compositions in illustration of it, without believing that *Pythagoras* and *Plato* derived their sublime theories from the same fountain with the sages of *India*. The *Scythian* and *Hyperborean* doctrines and mythology, may also be traced in every part of these eastern regions; nor can we doubt that *Wod*, or *Oden*, whose religion, as the northern historians admit, was introduced into *Scandinavia* by a foreign race, was the same with *Buddh*, whose rites were probably imported into *India* nearly at the same time, though received much later by the *Chinese*, who soften his name into FO'.

This may be a proper place to ascertain an important point in the Chronology of the *Hindus*; for the priests of *Buddha* left in *Tibet* and *China*, the precise epoch of his appearance, real or imagined, in this Empire; and their information, which had been preserved in writing, was compared by the *Christian* missionaries and scholars with our own era. *Couplet*, *De Guignes*, *Giorgi*, and *Bailly*, differ a little in their accounts of this epoch; but that of *Couplet* seems the most correct. On taking, however, the medium of the four several dates, we may fix the time of *Buddha*, or the ninth great incarnation of *Vishnu*, in the year one thousand and fourteen before the birth of *Christ*, or two thousand seven hundred and ninety-nine years ago. Now the *Cáshmirians*, who boast of his descent in their kingdom, assert that he appeared on earth about two centuries after *Crishna*, the *Indian Apollo*, who took so decided a part in the war of the *Máhabhárat*; and if an etymologist were to suppose that the *Athenians* had embellished their poetical history of *Pandion's* expulsion, and the restoration of *Ægeus*, with the *Asiatick* tale of the *Pándus* and *Yudhishtir*, neither of which words they could have articu-



lated, I should not hastily deride his conjecture: certain it is, that *Pándumandel* is called by the *Greeks* the country of *Pandion*. We have, therefore, determined another interesting epoch, by fixing the age of *Chrishna* near the *three thousandth* year from the present time; and, as the three first *Avatàrs*, or descents of *Vishnu*, relate no less clearly to an Universal Deluge, in which eight persons only were saved, than the *fourth* and *fifth* do to the *punishment of impiety*, and the *humiliation of the proud*, we may for the present assume, that the *second*, or *silver*, age of the *Hindus* was subsequent to the dispersion from *Babel*; so that we have only a dark interval of about a *thousand* years, which were employed in the settlement of nations, the foundation of states or empires, and the cultivation of civil society. The great incarnate Gods of this intermediate age are both named *Râma*, but with different epithets; one of whom bears a wonderful resemblance to the *Indian Bacchus*, and his wars are the subject of several heroic poems. He is represented as a descendant from *Súrya*, or the *Sun*; as the husband of *Sítá*, and the son of a princess named *Caúfeylá*. It is very remarkable, that the *Peruvians*, whose *Incas* boasted of the same descent, styled their greatest festival *Ramafitoa*; whence we may suppose that *South America* was peopled by the same race, who imported into the farthest parts of *Asia*, the rites and fabulous history of *Râma*. These rites, and this history, are extremely curious; and although I cannot believe, with *Newton*, that ancient mythology was nothing but historical truth in a poetical dress; nor, with *Bacon*, that it consisted solely of moral and metaphysical allegories; nor, with *Bryant*, that all the heathen Divinities are only different attributes and representations of the *Sun*, or of deceased progenitors; but conceive that the whole system of religious fables rose, like the *Nile*, from several distinct sources; yet I cannot but agree that one great spring and fountain of all idolatry, in the four quarters of the globe, was the

veneration



veneration paid by men to the vast body of fire which “ looks from his sole dominion like the God of this “ world ;” and another, the immoderate respect shewn to the memory of powerful or virtuous ancestors, especially the founders of kingdoms, legislators, and warriors, of whom the *Sun* or the *Moon* were wildly supposed to be the parents.

III. The remains of *Architecture* and *Sculpture* in *India*, which I mention here as mere monuments of antiquity, not as specimens of ancient art, seem to prove an early connection between this country and *Africa*. The pyramids of *Egypt*, the colossal statues described by *Pausanias* and others, the Sphinx, and the *Hermes Canis*, (which last bears a great resemblance to the *Varâhâvatâr*, or the incarnation of *Viṣṇu* in the form of a *Boar*,) indicate the style and mythology of the same indefatigable workmen who formed the vast excavations of *Canârah*, the various temples and images of *Buddha*, and the idols which are continually dug up at *Gayâ*, or in its vicinity. The letters on many of these monuments appear, as I have before intimated, partly of *Indian*, and partly of *Abyssinian* or *Ethiopick*, origin; and all these indubitable facts may induce no ill-grounded opinion, that *Ethiopia* and *Hindustân* were peopled or colonized by the same extraordinary race; in confirmation of which, it may be added, that the mountaineers of *Bengal* and *Bahâr* can hardly be distinguished in some of their features, particularly their lips and noses, from the modern *Abyssinians*, whom the *Arabs* call the children of *Cûsh*. And the ancient *Hindus*, according to *Strabo*, differed in nothing from the *Africans*, but in the straightness and smoothness of their hair, while that of the others was crisp or woolly; a difference proceeding chiefly, if not entirely, from the respective humidity or dryness of their atmospheres. Hence the people who received the first light of the rising  
G g 2
sun,



*sun*, according to the limited knowledge of the ancients, are said by *Apuleius*, to be the *Arü* and *Ethiopians*, by which he clearly meant certain nations of *India*; where we frequently see figures of *Buddha* with *curled hair*, apparently designed for a representation of it in its natural state.

IV. It is unfortunate that the *Silpi Sástra*, or *Collection of Treatises on Arts and Manufactures*, which must have contained a treasure of useful information on *dying*, *painting*, and *metallurgy*, has been so long neglected, that few, if any, traces of it are to be found; but the labours of the *Indian* loom and needle have been universally celebrated; and *fine linen* is not improbably supposed to have been called *Sindon*, from the name of the river near which it was wrought in the highest perfection. The people of *Colchis* were also famed for this manufacture; and the *Egyptians* yet more, as we learn from several passages in scripture, and particularly from a beautiful chapter in *Ezekiel*, containing the most authentic delineation of ancient commerce, of which *Tyre* had been the principal mart. Silk was fabricated immemorially by the *Indians*, though commonly ascribed to the people of *Serica*, or *Tancùt*, among whom probably the word *Sèr*, which the *Greeks* applied to the *silk-worm*, signified *gold*; a sense which it now bears in *Tibet*. That the *Hindus* were in early ages a *commercial* people, we have many reasons to believe; and in the first of their sacred law tracts, which they suppose to have been revealed by *Menu* many millions of years ago, we find a curious passage on the legal *interest* of money, and the limited rate of it in different cases, with an exception in regard to *adventures at sea*; an exception which the sense of mankind approves, and which commerce absolutely requires; though it was not before the reign of *Charles I.* that our own jurisprudence fully admitted it in respect to maritime contracts.

We

We are told by the *Grecian* writers, that the *Indians* were the wisest of nations; and in moral wisdom they were certainly eminent. Their *Níti Sástra*, or *System of Ethicks*, is yet preserved; and the Fables of *Vishnu-ferman*, whom we ridiculouſly call *Pilpay*, are the most beautiful, if not the most ancient, collection of apoloques in the world. They were first translated from the *Sanſcrit*, in the *sixth* century, by the order of *Buzerchumihr*, or *Bright as the Sun*, the chief phyſician, and afterwards *Vezír*, of the great *Anúſhirevân*, and are extant under various names in more than twenty languages; but their original title is *Hitópadéſa*, or *Amicable Instruction*: and, as the very existence of *Æſop*, whom the *Arabs* believe to have been an *Abyſſinian*, appears rather doubtful, I am not disinclined to suppose that the first *moral fables* which appeared in *Europe* were of *Indian* or *Ethiopian* origin.

The *Hindus* are said to have boasted of *three* inventions, all of which, indeed, are admirable; the method of instructing by *Apologues*; the *decimal Scale*, adopted now by all civilized nations; and the game of *Cheſs*, on which they have some curious treatises: but if their numerous works on Grammar, Logick, Rhetorick, Muſick, all which are extant and accessible, were explained in some language generally known, it would be found, that they had yet higher pretensions to the praise of a fertile and inventive genius. Their lighter poems are lively and elegant; their epick, magnificent and sublime in the highest degree. Their *Purána's* comprise a series of mythological Histories, in blank verse, from the *Creation* to the supposed incarnation of *Buddha*: and their *Védas*, as far as we can judge from that compendium of them which is called *Upaniſhat*, abound with noble speculations in metaphyſicks, and fine discourses on the being and attributes of *God*. Their most ancient medical book, entitled *Chereca*, is believed to be  
the



the work of *Siva* : for each of the Divinities in their *Triad* has at least one *sacred* composition ascribed to him. But as to mere human works on *History* and *Geography*, though they are said to be extant in *Cashmír*, it has not been yet in my power to procure them. What their *astronomical* and *mathematical* writings contain, will not, I trust, remain long a secret : they are easily procured, and their importance cannot be doubted. The Philosopher whose works are said to include a System of the Universe, founded on the principle of *Attraction* and the *central* Position of the Sun, is named *Yavan Achârya*, because he had travelled, we are told, into *Ionía*. If this be true, he might have been one of those who conversed with *Pythagoras*. This at least is undeniable, that a book on Astronomy, in *Sanscrit*, bears the title of *Yavana Jâtica*, which may signify the *Ionick Sect*. Nor is it improbable, that the names of the Planets and *Zodiacal* Stars, which the *Arabs* borrowed from the *Greeks*, but which we find in the oldest *Indian* records, were originally devised by the same ingenious and enterprising race, from whom both *Greece* and *India* were peopled ; the race who, as *Dionysius* describes them,

———— ‘ first assayed the deep,  
 ‘ And wafted merchandize to coasts unknown :  
 ‘ Those who digested first the starry choir,  
 ‘ Their motions mark’d, and call’d them by their names.”

Of these cursory observations on the *Hindus*, which it would require volumes to expand and illustrate, this is the result ; that they had an immemorial affinity with the old *Persians*, *Ethiopians*, and *Egyptians* ; the *Phe-  
 nicians*, *Greeks*, and *Tuscans* ; the *Scythians*, or *Goths*,  
 and *Celts* ; the *Chinese*, *Japanese*, and *Peruvians* ; whence,  
 as no reason appears for believing that they were a co-  
 lony

lony from any one of those nations, or any of those nations from them, we may fairly conclude that they all proceeded from some *central* country, to investigate which will be the object of my future Discourses; and I have a sanguine hope that your collections, during the present year, will bring to light many useful discoveries; although the departure for *Europe* of a very ingenious member, who first opened the inestimable mine of *Sanscrit* literature, will often deprive us of accurate and solid information concerning the languages and antiquities of *India*.



## XXVI.

## CORRECTIONS

OF THE

Lunar Method of finding the Longitude.

*By Mr. REUBEN BURROW.*

THE intent of the following remarks is to point out an error in the usual Practice of making the Lunar Observations, and another in the Method of Computation.

It is well known that a little before and after the conjunction, the whole hemisphere of the Moon is visible, and the enlightened crescent seems to extend some distance beyond the dusky part. Now, having determined the longitude of a place from the eclipses of Jupiter's Satellites, I took several sets of distances of the Moon's limb from a Star near the time of the conjunction, both from the bright and the dusky parts of the circumference, and having calculated the results, I found that those taken from the dusky part were much nearer the truth than the others. The nature of the error evidently shewed, that the star had really been at some distance from the limb when it appeared to be in contact with it; and, as the error was a considerable part of a degree, I saw it would be of consequence to discover the cause of it; which, however, was obvious enough from *Newton's* principles, and may be explained as follows.

Let

Let AD be the diameter of the moon, and A the center of a star in contact with the moon's limb: now, as the enlightened part of the moon evidently appears to extend beyond the dusky part, let the concentric circle BC represent the moon's limb thus apparently magnified, and suppose the star to be equally magnified; then with the center A, and the distance DC, describe a circle, which consequently will touch the moon's apparent circumference inwardly: now, as this last is a consequence of supposing the center of the star to touch the circumference of the moon, exclusive of the deception, it follows, *that the proper method of taking the distance, is to make the star appear to touch the moon inwardly.*

But all the writers on this subject have particularly directed that the star be made to touch *outwardly*. Let B, therefore, be the point of contact, and *a* the center: the error then is Aa, or the sum of the apparent increase of the moon's radius, and the apparent radius of the star: this quantity, it is evident, will make a considerable error in the result; and errors arising from this source are the more to be attended to, as they are not of a kind to be lessened by increasing the number of observations. The same reasoning is applicable to the Sun and Moon, with very little alteration.

The distance of the Moon from the Sun or a Star, at each three hours, is given in the Nautical Ephemeris; and the method of inferring the time for any intermediate distance, is by simple proportion: this would be just if the Moon's motion was uniform: but as this is not the case, the velocity should be taken into the account, as well as the space, in determining the time taken by the Moon to move any given distance; and the proper measure of the velocity is such a quantity as has the same ratio to the space described, as three hours have to the time that has been actually taken to  
move



move the given distance: to find this quantity correctly, would require interpolation; but it will be sufficient in practice to find the time first by the common method, and then to correct the interval for three hours to that time, by taking a proportional part of the second difference of the Moon's distance at the beginning of each three hours; supposing the first differences to answer to the middle of each interval.

The last correction, though not so considerable as the first, will often bring the result nearer to the truth by three, four, five, or six miles, and sometimes more, which in geographical determinations is of consequence; and, by paying attention to those and some other causes of error, which shall be pointed out hereafter, the results in general will be much nearer to the truth than is usually imagined. It is common to throw blame on the imperfections of the Lunar Tables, but it would be much more properly applied to bad instruments and bad observers.

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*From 15 January 1784, to 15 January 1789.*

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APPENDIX

TO THE

FIRST VOLUME

OF

ASIATICK RESEARCHES.

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A

METEOROLOGICAL JOURNAL,

*Kept by Colonel T. D. PEARSE, from 1st March 1785,  
to 28th February 1786.*

VOL. I.

H h



Day.	Time.	Barometer.	Thermometer.		Clouds.		Wind.		Ram.	March 1785, Miscellaneous.
			In.	Out.	Kind.	Quant.	Quarter.	Force.		
3	m. m. 22.49	L. Q.								(a)
6	7.15 A	29,963	77		thin	3	SSW	1		(b)
7	3. P	29,915	79		thin	5	SSW	3		(c)
	6.30 P				thick thunder	10	SSW	3		
8	7.30 A	30,00	76		thick thunder	9	SSW	2		(d)
	7. P				thick	10				
	8. P						NW			
9	7. A	30,032	75.5		thick thunder	8	NW	1		(e)
	1.55 P	29,97	79.5		none					
	16.27	D New								
10	4.50 P				thick thunder	9	NW	6		
	5.39 P	29,95	76.5		ditto	8	S	3		(f)
	6.15 P	29,95	70		ditto	8	S	4	142	
11	7. A	30,00	79				S by W	1		(g)
12	6.35 A	29,95	79				S by E	1		(h)
13	6. A	29,85	79		thin	2	S by E	1		
	2. P				thick	4	S	3		
	4. P				thick thunder	8	S by E	3		
	5.2 P	29,77	80.5		thick thunder	9	S	5	259	
	5.30 P									
14	7. A	29,816	83		thick	6	SSE	2		
	2.20 P	29,854	79.5		thick	9	SSE	2		
15	6.45 A				thick thunder	9	S by E	1		(i)
	8.25 P				ditto	10	N	5		
16	7.40 A	29,873	78		thick loofe	8	SSW	4	022	(k)
	2.20 P	29,813	82							

Day.	Time.	Barometer.	Hygrometer.	Thermometer.		Clouds.		Wind.		Rain.	March 1785, Miscellaneous.
				In.	Out.	Kind.	Quant.	Quarter.	Force.		
17	12.52 7.15 A	D F. Q. 29.887		80		thick	5	SE	1	,039	(l)

(a) Last Friday the fog was excessive, and did not begin to clear till nine. Saturday the same. Sunday it began to clear about 7.

(b) The fog is gone off to day already: it was but slight.

(c) Much lightning in the NW. and distant thunder.

(d) Much lightning in the NW. A puff from the NW. but without rain or thunder.

(e) There was a very small sprinkling of rain just now.

(f) In the morning we had a thick fog, which formed into clouds, and went over to the N. and at 2 masses were formed there; from whence at 4.50 we had a storm, which was over in half an hour; and at Dumdum, about 10 miles off, they had heavy hail.

(g) Fog so thick that an object at a 100 yards is invisible.

(h) 6. A. foggy. A storm will come on in the evening. 4. P. Distant thunder. 5. 2. P. We have had a furious storm of hail with thunder and lightning, and SW to SSE 6. 5. 30. P. Loud thunder still continues in the ENE. where the mass now is.

(i) 6.45 A. Every thing hidden in fog, which will produce a storm at night. 8.25 P. Much lightning, and the expected storm coming on.

(k) 7.40 A. The thunder rolled all night: excessive lightning.

(l) 7.15 A. A storm began to gather about 5 P. and we had much lightning about 10. Between 12 and 1 it began, and the wind very violent. The thunder close, and so heavy, that it jarred the whole house like an earthquake. 2.30 P. It has been very gloomy at times all day.



Day.	Time.	Barometer.	Hygrometer.	Thermometer.		Clouds.		Wind.		Rain.	March 1785, Miscellaneous.
				In.	Out.	Kind.	Quant.	Quarter.	Force.		
17	2.30 P	29,828		84		thick	4	SSE	2		
18	6. A	29,915		80		thin	3	S	1		
	2. P	29,85		86		loofe	3	S	4		
19	2.20 P	29,813		84				W by S	2		
20	1.30 P	29,833		85		thin	9	SSW	3		
21	6.15 A	29,813		81		thin	2	SW by S	2		
	2. P	29,80		86		thick and thin	5	S by W	4		
22	6.30 A	29,825		82		thick loofe	10	SW by S	3		(m)
	2. P	29,837		86		thick	3	SW by S	5		(n)
23	2. P	29,784		85.5		thin	7	SW by S	3		
	7.45 A					thick thunder	10	SSW	5	.084	
24	8. A	29,87		81.5		thick	7	W by S	2		
	2. P	29,825		85		thick thunder	10			.001	
	9. h.m.										
	16.02	D Full									
25	6.15 A	29,859		82		thick	4	SSE	2		
	2. P	29,866		86		none		S	3		
26	5.45 A	29,915		82		thick loofe	10	S	1		(p)
	2.15 P	29,87		86.2				S	4		
27	7.15 A	29,865		82		thick	10				
	2.15 P	29,785		87				S	2		(q)
28	6.45 A	29,795		81				S	1		
	2.10 P	29,798		87.5				SSW	4		
29	6.45 A	29,862		81.5		thin	2	S $\frac{1}{2}$ W	1		(r)
	2.15 P	29,830		87.0				SSW $\frac{1}{2}$ W	3		
30	6.45 A	29,822		81.5		thin	5	S $\frac{1}{2}$ E	1		(s)
	1.30 P	29,848		83.5		thick	10	NE	1		

Day.	Time.	Barometer.	Thermometer.		Clouds.		Wind.		Rain.	March 1785, Miscellaneous.
			In.	Out.	Kind.	Quan.	Quarter.	Force.		
31	7.15 A	29.862	79.0		thick	10	NNE	1		
	2. P	29.797	83.0		thick	9	NNW	1	.007	(t)
Total in March									.554	

(m.) Great appearance of approaching rain and storms.

(n.) 8. A. The morning was very cloudy, and the wind strong; it prefaged a storm; and I still expect one before mid-night. At sun-set it threatened, and at 7 P. the lightning began to be vivid in the WNW. It rained for about ten minutes. The thunder was very near.

(o.) 8. A. The wind began about 11. P. and raged till past 1 o'clock with uncommon violence. 2. P. Excessively gloomy.

9. P. At 7 we had a thunder gust, which was soon over, with a sprinkling only.

(p.) 5. 45 A. The clouds began to collect at 8 last night, and are very thick. 2. 15 P. The clouds continued very thick till past 10, and were not dispelled till past 1.

(q.) 6. 45 A. Excessively thick fog. 2. 10 P. The true along-shore wind, which disorders the whole frame.

(r.) 6. 45 A. Foggy. Last night the clouds were thick 10 at 11 P.

(s.) 6. 45 A. Foggy. It has been extremely gloomy ever since 7 o'clock, and about noon we had a few drops of rain.

(t.) 7. 15 A. We had a small shower of rain about sun-rise, and there has been more at a distance from the feel of air.





Day.	Time.	Barometer.	Hygrometer.		Thermometer.		Clouds.		Wind.		Rain.	April 1785. Miscellaneous.
					In.	Out.	Kind.	Quant.	Quarter.	Force.		
12	7.15 A	29,740			90,5	83						
	2.30 P	29,765			82	100,5	thick and thin	10	NE	2		
13	6 30 A	29,783			84	81	thick	10	SW by S	2		
	10. P	29,818			83	83,5	thick	9	N	1		(i)
14	7. A	29,820			86	85	thick	10	S by W	3		(k)
	2.30 P	29,848			82	88	thick	10	S	2		
15	7. A	29,915	28		85	81	thick	10	S $\frac{1}{2}$ W	1		(l)
	1.45 P	29,900	22,5			92	thick	10	NE	1		

- (a) We had a sprinkling rain to-day of half an hour's duration.
- (b) Excessively thick haze.
- (c) Last night the clouds were so heavy that they seemed to threaten a storm.
- (d) There were flying clouds from 8 till 11 to-day, but all are gone.
- (e) Yesterday evening there was a mass over Calcutta, and much lightning and some thunder, and this morning we had a fog.
- (f) There will be a storm to-day. 5 30 P. Distant thunder. The bank is not yet formed.
- (g) The wind was tempestuous the greatest part of the night, but we had not any rain. It is now foggy, and threatens.
- (h) Yesterday there was every reason to expect a violent storm, but it went off from us. To-day there was but little expectation, and now it rains smartly, and there has been a great deal of thunder; and all this without any change of wind.
- (i) We had a small shower at 1, and another just now. The wind was NE 2 all the afternoon.
- (k) The wind changed suddenly just after last observation to the S again, and we had a very windy night. 2.30 P. It has been gloomy all day.
- (l) A sprinkling rain in very distant drops. The wind of the night was of such a kind, that it prevented the possibility of sleeping.
- The morning rain, and a like sprinkling since, could not be measured.



Day.	Time.	Barometer.	Thermometer.		Clouds.		Wind.		Rain.	April 1785, Miscellaneous.
			In.	Out.	Kind.	Quant.	Quarter.	Force.		
16	7. A	29,95	80	82,5	Brought forward, thick	10	N	4	,018	(m)
	8.15 A	29,99	80	74	ditto	10	NE by E	3	,087	
	2.15 P	29,893	80	80	ditto	10	NE	4		
	3.44 P	D F. Q.								
17	7.15 A	29,864	70,5	86	thick	10	E by N	4	1,314	(n)
	2.15 P	29,79	78	75	thick	10	S by E	3	,763	
	8.20 P	29,828	78	74	thick loofe	10	SE $\frac{1}{2}$ E	3	,752	(o)
18	6.15 A	29,80	79,5	76	thick	9	SSW $\frac{1}{2}$ S	1	,284	
	2.15 P	29,839	80,5	86	thick white scat.	4	NW	1		(p)
19	7. A	29,913	80		thick loofe	7				
	2.15 P	29,813	83,5	90	thick white	7	SW $\frac{1}{2}$ S	2		
20	5.40 A	29,8	79,5	76	thin	4	S by W	2		
	2.25 P	29,792	86	90	thick loofe	4	S	4		
	10. P	29,881	76,5	80,9	thick	10	NNE	3		(q)
21	6. A	29,812	76,9	73,5	thick	3	SSE	3		
22	8. A	29,876	77	74	thick	10	SW by S	3	,410	(r)
	2. P	29,785	82	89	scattered	2	SSW	3	,007	
23	5. A	29,750	79	77			SW	2		
	2.15 P	29,760	86	93			S by W	2		
24	7. A	29,748	82,5	84			S	2		
	2. P	29,722	87,5	94	scattered	2	S by W	3		
	8.8 P	D Full.								
25	6.30 A	29,71	83	83			SSE	2		
	2. P	29,71	90,5	96,5	scattered	3	S $\frac{1}{2}$ E	4		(s)
26	7.15 A	29,740	84	85	scattered	3	S	2		(t)
	2. P	29,735	89	94	thick	9	S by E	4		
27	7. A	29,705	84						,220	(v)

Day.	Time.	Barometer.	Thermometer.		Hygrometer.		Clouds.		Wind.		Rain.	April 1785. Miscellaneous.
			In.	Out.			Kind.	Quant.	Quarter.	Force.		
27	2. P	29,697	87,5	91	43		thick	9	S by E	4		
	7. P	29,711	83	86	43		thick thunder	10	NNE to NNW	7		
	8. P								NNW		,170	
28	9.45 P	29,713	81,5	78	40		none		WNW	9	,270	(w)
	6.45 A	29,723	87,5	93	44				SW by S	2	,013	
29	2. P	29,713	83,5	80,5	49		none		SW by S	2		(x)
	6. A	29,713	83,5						SW by S	2		
	2. P	29,753	87,5	93	37				W by S	2		
30	7. A	29,79	83,5	84	50		none		SW by S	2		
	2. P	29,79	91	97,5	37,5		thick small feat.	2	SSW	4		
Total in April 4,308												

(m) It has been a blowing cold night; wind northerly, and it sprinkles rain. 8.15 A. An heavy shower just over, and drizzling rain still continues. 2.15 P. We have had more sprinkling rain.

(n) About 6 yesterday it began to rain in drops; before 9 it was smart rain: It has continued all night, and still rains. 2.15 P. It has rained incessantly all day. It still rains hard, and now the clouds begin to break a little. 8.20 P. It still sprinkles.

(o) It began to thunder at a great distance about 8, and by 12 it was near us; and this put an end to the rain before 3 A.

(p) The morning was foggy.

(q) A small shower of rain, and the wind changed from S to NNE.

(r) At 12 P. a mafs formed in the NW. came on; and in a short time we had a storm without thunder. It sprinkles to-day.

2. P. Produce of the sprinkling.

(s) Very hazy and foul air.

(v) A regular northwester last night at 8 P. 7 P. Springling rain begun. 8 P. The produce of the storm, which has abated: diftant thunder. 9.45 P. A very severe storm just over, which began about 8.20. It still thunders.

(w) This was, with produce of a small shower, about 10.30 P.

(x) The night very hot, and the air loaded with damp; the morning cool and pleasant.

(t) Lightning last night; and very foul air to-day.



Day.	Time.	Barometer.	Thermometer.		Clouds.		Wind.		Rain.	May 1785, Miscellaneous.
			In.	Out.	Kind.	Quant.	Quarter.	Force.		
1	7.40 A	29,813	84	86			SW	3		(a)
	2.10 P	29,762	90	98,5			W	3		
	6.22 A	D L. Q.								
2	7.45 A	29,750	84	86	scattered	3	SW	4		
	2. P	29,710	89	98	ditto	1	SSW	3		
3	6. A	29,712	83,9	82			SSW	2		
	2. P	29,720	89	95	none		SSW	4		
4	6. A	29,735	83,3	82			S by W	2		
	2.20 P	29,780	88,5	93			SSW	4		
5	5.30 A	29,745	83,5	81,5	loose	9	S by W	2		
	2. P	29,746	89	94	ditto	3	S by W	5		
6	5.30 A	29,808	82	79,5			S by W	2		
	2. P	29,800	88	94,5	thin	2	S by W	5		
	8.45 P	29,997	82,5	78,5	thick thunder	10	NW by W	7	328	
	9. P	30,000	82	72	ditto	10	NW by W	3		
7	5.30 A	29,840	81,5	76,5	thin	8	NNW	1		(b)
	6. A	29,897	81	81	thick	5	S by W	1		
	2.30 A	29,90	88	94	thick	3	SSW	4		
	10.25 P	D New								
9	5.30 A	29,875	81,5	80	thin	7	S	1		
	2. P	29,882	88	95,5	thick	6	SW by S	4		
	7. A	29,867	82,7	84,6	thin	3	SW by S	3		
	2. P	29,843	88	95,5	thick	5	S by W	4		
	7. A	29,810	83,3		thick and thin	10				
11	2. P	29,783	89	97,5	thick scat.	2	SSW	4		
	7.30 P	29,744	87,5	86,7	thunder	4	SSW	3		
	7.47 P	29,814	87		ditto	9	NW	5		
	7.55 P	29,814	87	82	thunder	9	NW	7		

Day.	Time.	Barometer.	Thermometer.		Clouds.		Wind.		Rain.	May 1785. Miscellaneous.
			In.	Out.	Kind.	Quant.	Quarter.	Force.		
11	8.25 P	29,808	83	73	ditto	10	NW by W	2	.325	
12	9.	29,754	79,5	74	ditto	10	ENE.	2		
	5.40 A	29,718	82,5	81	thick	10	S by W	2		
13	2.20 P	29,752	89	96			SSW	4		
	7.30 A	29,753	85	85	thin	7	S	4		
14	2.20 P	29,754	91,5	98,5	loose	8	S by E	3		(c)
15	5.	29,785	82	78	thick	3	N by W	1		(d)
	5.	29,797	81,9	81,3	thin		E by S	2		
16	2.	29,765	90,5	96		2	NE	3		
	7.10 P	29,752	88,7	88,3	thick thunder	9	W by S	3		(e)
	6.15 A	29,777	83	82,2	thin	2	NE	1		
	8.54 A	D F. Q.								
	2.	29,740	89	95,5	thick thunder	4	WNW	2	,653	
							Carried forward			

(a) Much lightning last night, and a mas in N and NW. from whence we had a blast of wind at 10 P. 8.45 P. Sprinkling rain begun. 9. P. Very heavy thunder; a smart shower just over.

(b) A heavy thunder mas in NW. and much lightning, with distant thunder. 7.47 P. The wind just changed, and the mas reached the zenith. 7.55 P. Small rain begun. 8.25 P. Heavy rain over small rain continues.

(c) A very oppressive heat to-day. The air does not carry off perspiration, and makes the whole body calmy and comfortable.

(d) The heat produced thunder all the afternoon till near ten, with squalls of wind from every quarter in turn, but without rain.

(e) The wind shifted about a quarter of an hour ago.





Day.	Time.	Barometer.	Thermometer.		Clouds.		Wind.		Rain.	May 1785, Miscellaneous.
			In.	Out.	Kind.	Quant.	Quarter.	Force.		
29	9.10 P	29.703	86	86	thunder	10	S	0		
30	8.25 P	29.757	86	86	ditto	10	N by E	1		
	6.40 A	29.710	84	83.5	thick and thin	5	SW by W	2	,173	
31	10.40 P	29.663	86.5	85.5	thunder	10	SSW	3		(p)
	7.40 A	29.641	86.3	80	thunder	10	ESE	2	,697	(q)
	11.57 A	D L. Q.								
	2.20 P	29.590	87	93	thick	7	SW	3		
Total in May - 3,690										

(f) The clouds were 6 about 10, but are all gone.

(g) A small thunder shower at 7 P. yielded the water. It came from ENE. 10.30. A. A thunder shower just over of about ten minutes duration. 11.5 A. A very heavy thunder storm just over: it began immediately after last observation.

(h) We had another storm in the night, with a sprinkling of rain.

(i) We had a mass of thunder clouds from NNW. last night without rain. 2.10 P. The heat very oppressive.

(k) We were almost suffocated last night. I could not close my eyes till past four.

(l) It rains, and there has been distant thunder. 6.55 P. Thunder close and loud; heavy rain.

(m) Between 11 and 12 the storm came on again heavier than before. 2 P. The air does not carry off perspiration, and therefore leaves the body clammy. 8.50 P. At 7 we had a most furious storm from N 8; a torrent of rain, but of short duration; and all has been quiet this hour.

(n) After last observation, it began to rain small rain, which continued some time.

(o) We had in town a very violent northwester, and it reached the gardens, where it produced this rain. 1.11 P. The day has been hot, and the sky covered with thin clouds; since 8 they have collected, and we had much lightning in the WNW. and now the storm has reached us.

(p) Much lightning in the NNE. and distant thunder.

(q) It sprinkled rain soon after last observation, but at 5 A, we had a tremendous thunder storm.



Day.	Time.	Barometer.	Hygrometer.	Thermometer.		Clouds.		Wind.		Rain.	June 1785, Miscellaneous.
				In.	Out.	Kind.	Quant.	Quarter.	Force.		
1	7.10 A	29,570	47	84	86,5	thunder	5	SSW	3		(a)
	2.30 P	29,525	37	89	103,0			SSW	3		
	8.40 P	29,612	41	88,5	88	thunder	10	WNNW	5		
	9.15 P	29,637	38	85,2	77	ditto	10	SS $\frac{1}{2}$ W	4		
2	7. A	29,585	45	84	85	thick	8	S by E	3	,665	(b)
	2.20 P	29,590	42	84	88	thick	10	S by E	3		
3	6.40 A	29,565	46	82	83	thin	3	SE	3		
4											
5										,168	(c)
6	8. A	29,592	48	84	87	thick	6	ESE	2	,154	(d)
7	7.38 A	D New									(e)
8	8.20 A	29,616	51	83	84,5	thunder	10	SSE	3	,100	(f)
	8.20 A	29,621	52	83		thick	10	SE by S	4		
	2.20 P	29,580	48	83,5	88	thick	10	S by E	3	,503	(g)
9	8.40 A	29,657	47,5	80	77	thick loofe thun.	10	SSW	3	,700	(h)
	1 50 P	29,625	50	81	79,5	ditto	10	SSE	4	,469	
10	8.15 A	29,655	55	83	87	thick scat. loofe	5	S by E	4		
	2.15 P	29,617	52,5	83,5	86	ditto	10	S by W	4	,036	(i)
11	7.30 A	29,655	57,5	83	88,5	scattered	4	S by E	3	,056	(k)
	2.20 P	29,633	48,5	88	95	scattered	6	S by E	4		
12	7.30 A	29,653	53,0	84	87,5	loofe	7	S by E	4		
	2.23 P	29,580	45,0	86	96	loofe	5	S	4		
13	5.35 A	29,593	54	83	82	thin	5	S	2		
14	5.25 A	29,500	50	83	81,5	thin	5	S	2	,478	(l)
	2.28 A	D F. Q.									
15	7.25 A	29,420	51	83,5	82,5	thick and thin	9	NW	3	,006	(m)
	2.20 P	29,367	53	82,5	80,5	thick	10	NW	4	1,317	
16	7.40 A	29,472	52,5	80,5	78	thick loofe	10	WSW	3	1,700	(n)

Day.	Time.	Barometer.	Hygrometer.	Thermometer.		Clouds.		Wind.		Rain.	June 1785, Miscellaneous.
				In.	Out.	Kind.	Quant.	Quarter.	Force.		
16	2.15 P	29,450	53	83	87	thick	10	SW by S	3	,188	(o) (p)
17	6.15 A	29,504	55	80	78	thick	10	SW by S	3	,477	
18	6.35 A									1,736	
	8.15 A	29,630	55	79	75,8	thick loofe	10	S by E	3	,200	
	2.15 P	29,581	55	82,5	85	thick	10	S by E	3	,150	
Carried forward										10,104	

(a) There was a great deal of thunder last night. About 2 it was most oppressively fultry, being a dead calm. 8.40 P. After excessive lightning in the NW. the mafs has reached us, and the storm is begun. 9.15 P. It still rains smartly; the thunder now approaches, but is very far off. This looks more like the rains than any thing we have yet had; and if wind veer to the south we may reasonably expect them.—(b) Produce of last night's storm.—(c) Produce of a thunder-storm at noon.—(d) Ditto, and at noon also.—(e) There was a storm at noon, and at dinner time, and the evening was fine.—(f) It has rained this morning with thunder: this water is yesterday's and to-day's.—(g) We had rain yesterday, and twice to-day, and this is the produce of all.—(h) It began to blow and thunder and lighten at 12.30, and before 1 A. we had a heavy shower. Ever since it has rained more or less, with much thunder. 1.50 P. It has rained without ceasing, more or less, ever since morning.—(i) We have had a thunder shower from SW.—(k) There was a shower at day-break.—(l) At 6 P. yesterday a heavy shower from NW gave this water: and there was only a sprinkling in town.—(m) There was a small shower about 3, and another about 9 P. 2.20 P. Heavy showers began about 9, and still continue with short intervals.—(n) It has rained ever since last observation; at times only sprinkling; at others smartly; and now moderately. 2.15 P. The rain abated gradually, and ceased before noon.—(o) At 9 P. a thunder storm from the W brought on rain again, and it continued till morning.—(p) It was running out through the air-hole. How long it had done so I cannot tell; but it rained all day yesterday; drizzling, and at times barely perceptible; heavily about 6 P. and drizzling till near day. Then hard again; and now it rains smartly, as it did when the water was measured; and there is some in the measure besides. 2.15 P. The rain ceased about 10, and the sun shone at noon.



Day.	Time.	Bar meter.	Hygrometer.	Thermometer.		Clouds.		Quant.	Wind.		Rain.	June 1785, Miscellaneous.
				In.	Out.	Kind.	Quant.		Quarter.	Force.		
19	8. A	29,558	58	81,5	84,3	Brought forward,	6		SSW	2	10,104	(q)
	2.20 P	29,528	52	83	82,8	scattered thick	10		W $\frac{1}{2}$ N	2	,375	
20	8. A	29,567	50	81,5	84,5	thin and thick	7		SSW	3	,156	(r)
	2.10 I	29,520	50	81,3	84,5	ditto	6		S $\frac{1}{2}$ E	4	,004	
21	7.35 A	29,549	53	80	78,5	loose low thick	10		S $\frac{1}{2}$ W	2	,332	(s)
	2.15 F	29,522	48	83	89,7	scattered	5		SW by S	4	,001	
22	7.25 A	29,552	53	81,5	81,5	thick	10		W	2	,007	(t)
	8.11 A	D Full										
	2.25 P	29,525	51,5	83	90,5	thick scat.	7		S by W	2		
23	8.50 A	29,539	55	82	79,5	loose	10		NW	1	3,250	(v)
	2.20 P	29,521	56,5	82	82,8	loose	10		S	3	,076	
	6.20 P	29,498	56			thick	10		S by E			
	6.55 I	29,516	56	83		thick loose low	10		S by E			
24	6.20 A	29,510	58,5	81,5	81,5	thin	10		SE	3	1,778	(w)
	11.45 F	29,524	58	82	81	thick scat.	8		SE	3	,068	
25	7.20 A	29,512	59	83	84,5	thick	8		ESE	4		
	2.40 F	29,472	53	83	92,5	thick scat.	5		SSW	2		
26	7.35 A	29,508	56,5	83,5	83,5	thick	7		WNNW	2	,073	(x)
	2. I	29,582	52,5	84	87	thick	9		SW	2		
	6.20 I	29,471	56	83	83,5	thick	5		SW by S	3	,507	(y)
27	7.15 A	29,490	59,5	84	84,5	thick low	10		SSW $\frac{1}{2}$ W	3	1,000	(z)
28	9. A	29,472	57	81,5	79,5	thick low loose	10		SE	3	,367	
	2.15 I	29,428	58,5	83,5	87,5	thick low	10		SW by S	3		(aa)
29	7.20 A	29,446	56,5	83	86	thick loose gat.	6		S by W	3		
	2.25 I	29,406	51,5	85	91	thick	9		S by W $\frac{1}{2}$ W	3		
30	4.21 F	D L. Q.					8		S $\frac{1}{2}$ W	3	,169	(bb)
	7. A	29,224	50,5	83	82	thick	8					

Day.	Rain.	June 1785, Miscellaneous.
30	,213	
	18,611	
	7,450	(cc)
	Total in June, 26,061	

(q) Between 10 and 11 P. there was a heavy shower, that produced 2 of this quantity; the rest fell this morning. 2.20 P. A shower just over.—(r) This was the end of the last shower. 2.10 P. A heavy shower about 11 o'clock in the forenoon.

(s) Mifty rain. 2.15 P. It cleared soon after last observation.—(t) A shower about 4 o'clock this morning.

(v) About 1 it began to rain in torrents. At  $\frac{1}{2}$  past three 2 inches were measured; at  $6\frac{1}{2}$  this morning a third; the rest fell since, and it still sprinkles. There was excessively heavy thunder, with most vivid lightning, at 3, though but little wind. 2.20 P. Drizzling rain all day. 6.55 P. A sprinkling about 6.35. Distant thunder.—(w) Soon after last observation it began to drizzle, and the mercury rose, but in a short time after fell again. The rain continued till 1 in the morning, and for about two hours was very heavy. 11.45 P. This fell in the course of the day, about 9, and again 2 P.—(x) A small shower at 7 P. yesterday, and another just over. 2 P. A shower in the forenoon. 6.20 P. A shower about 5 P. and the above produced this water.—(y) The night was clear, and stars bright.—(z) It was very gloomy at 9, with much lightning. About midnight it began to rain; towards morning more, and at 6 A. heavily, and ever since smartly, and so it still rains. 2.15 P. It rained till near noon, and is about to rain more.

(aa) The morning has been bright.—(bb) The rain fell about 8 P. last night in a smart shower from SW. wind 5. 213. This rain fell about 6 P. and was heavy for the time it lasted.

(cc) Add this for the overflowing on the 10, 18, 23, and 24, when the garden was all under water.



Day.	Time.	Barometer.	Hygrometer.	Thermometer.		Clouds.		Wind.		Ram.	July 1785, Miscellaneous.
				In.	Out.	Kind.	Quant.	Quarter.	Force.		
1	2.50	P 29,436	53	85	92	thick	4	E½N	3	,148	(a)
2	7.	A 29,483	55,5	83	85	thick	6	E½N	4		(b)
3	0.10	P 29,510	47,5	83	84	thick loofe low	10	ESE	5		
4	9.20	A 29,512	55,5	83	84	thick loofe	6	E½N	6	,300	
5	2.20	P 29,480	55,5	83,3	85	ditto	7	S by E	4	,450	(c)
6	8.12	P 29,556	54,5	82	84	thick	10	SW	4	,069	(d)
7	9.30	A 29,586	56,5	83	81,5	thick loofe	10	WNW	3	,900	
8	2.30	P 29,528	56	82	83	thick hard	10	SW by S	2	,017	
9	6.22	A D New									(e)
10	7.10	29,486	57	81	78,5	thick loofe	10	NW	2	,923	
11	2.45	P 29,415	58	82	80,5	loofe	10	SW by S	3	,150	(f)
12	7.					ditto	10	SW	7	,500	(g)
13	6.40	A 29,440	58	81	78,7	loofe	9	SW½S	3	,359	
14	8.	A 29,60	61	82	84	thin	6	SE	2		(h)
15	7.	A 29,654	62	82	83,5	thick thun. col.	5	S	4		(i)
16	0.15	P			94	ditto	7	S	4		(k)
17	2.	P 29,610	62	83,5	88,7	thick thunder	8	SSE	4		(l)
18	7.30	A 29,662	59	83	88	thick feat.	8	S½E	2	,036	
19	2.30	P 29,556	56	83,5	90,7	thick	10	SW by S	3	1,500	
20	7.30	A 29,516	58	83	82	loofe	10	SW by S	2	1,223	
21	2.30	P 29,460	58	83	86	thick	10	SSW	3	,016	(m)
22	6.40	A 29,494	55	81,3	80,7	thick	10	S by W	3		
23	7.28	A D F. Q.				Carried forward,				7,077	

- (a) The night very close and suffocating. After 3 in the morning, thunder and lightning, and a little wind with rain made it possible to sleep. 0.10 P. An heavy storm came on; the wind was N.E. the greatest part of the forenoon, now has changed.
- (b) It rained all the afternoon and till near 8 P. and about to rain again. 2.20 P. Flying showers, five or six since last observation.
- (c) The produce of several drizzling flying showers after last observation.
- (d) About 6 it began to rain, and there were, 400 at 9. It has rained almost all night, and there were, 500 drawn off just now; it still drizzles. The lightning fell close to the Bazar, that is about one-third of a mile from the house, but did not hurt any body.
- (e) Rain in the night with lightning. Heavy rain about day-break, and the shower but just over. 2.45 P. Showers all the forenoon, and now set in. 7. P. It has been a very rainy, windy afternoon, and it still continues so.
- (f) It has been tempestuous at times, and rained in flying showers all night.
- (g) The 7th in the evening. , 186 The 8 to 2 P. when it ceased.
- (h) It has thundered at a distance.
- (i) There was lightning about 10 P. but not any rain.
- (k) This rain fell yesterday about 4 P. It has not rained since.
- (l) It rained heavily last night, about 11, and it has just begun again gently. 2.30 P. The rain continued till past 1.
- (m) The rain fell in the evening about 6.



Day.	Time.	Barometer.	Hygrometer.	Thermometer.		Clouds.		Wind.		Rain.	July 1785, Miscellaneous.
				In.	Out.	Kind.	Quant.	Quarter.	Force.		
15	8.40	P 29.660	58.5	83	87	Brought forward, thick	9	SSW	4	7.077	(n)
16	2.40	P 29.586	54	85	91	thick	10	SW by W	3	,072	(o)
17	0.45	P 29.553	55	85	92	thick	7	SW by W	3	,184	(p)
18	2.20	P 29.442	54	83.3	85	thick	10	WSW	5	,340	(q)
19	7.20	A 29.468	57	81	78	thick loofe	10	SW by W	3	,291	(r)
21	10.20	P 29.596	60	83	82.5	thin	5	S½E	3	,430	
22	5.20	A D Full									
	6.15	A 29.586	64	82	81	thick loofe fog	9	S	2	,110	(s)
24	7.	A 29.682	61	80.9	81	thick	9	E by N	4	,014	
	2.20	P 29.650	55	84	90	thick	3	ENE	2		
25	5.45	A 29.675	58.5	81	80	thick	3	SSE	2		
26	8.50	A 29.686	54	84	87.5	thick and thin	8	SSW	2		
	2.30	P 29.627	51	85.6	91.5	thick	9	SE by S	3		(t)
	8.25	P 29.636	54	84	80	thick	8	NW by N	2	1,700	(v)
27	7.20	A 29.641	56.5	83	87	thick	5	S	1	0,007	
28	2.20	P 29.613	52.5	84	89.5	thunder	10	SE	4	,025	
	6.30	A 29.612	58.5	82	84.5	loofe	3	S by E	2		
	9.11	A D L. Q.									
29	1.20	F 29.562	52.5	86	91.5	thick	8	ENE	3		
30	8.10	A 29.580	56.5	83.9	87	thick	9	SSE	2		
	2.40	P 29.512	51.5	86.5	93	thick	8	S by W	3		
31	7.15	A 29.528	56	82.3	80.7	thick	9	NE½E	3	,226	(w)
	2.	P 29.370	58.5	80	79	thick	10	S	4	,016	(x)

	Rain.	July 1785, <i>Miscellaneous</i>
Overflowing.	10,392	(y)
	1,700	
	12,092	
Total in July, 12,192		

- (x) This rain fell the 14th in the night, and not any since.
- (o) Rain yesterday evening, and in the night before three o'clock.
- (p) A very tempestuous morning, and rain to-day also.
- (q) Sprinkling rain.
- (r) 4 fell on the 19th, the rest yesterday. Not any to-day. The forenoon was foggy and cloudy, very close and hot.
- (s) This fell the day before yesterday. 2.20 P. A thunder shower at 11. Excessive high tide to-day.
- (t) A shower just come on. 8.25 P. Two very heavy showers since 7. P. about which time it began with very heavy thunder from SE. and varied to NW.
- (v) The remainder of last night's storm, which was over when the last observation was entered. 2.20 P. A thunder shower about 12, and it now thunders, and more is coming on.
- (w) It rains hard. The wind has veered all round the compass at least twice since morning, with flying showers of small rain, and distant thunder, of deep and heavy sound.
- (x) The wind increased to 8, and blew so for above an hour, with rain, of which this is the produce.
- (y) And this for overflowing on the 26, and it could not be less.



Day.	Time.	Barometer.	Thermometer.		Clouds.		Wind.		Rain.	August 1885, Miscellaneous.
			In.	Out.	Kind.	Quant.	Quarter.	Force.		
1	6.	A 29,490	81	79,3	thick	3	S by E	3	0,005	(a)
2	6.10	A 29,515	81,7	81,3	thin and thick	4	SSW	2		
3	2.	P 29,515	83,2	88,7	thick thunder.	9	SE by S	3		
	5.40	A 29,561	81,5	81,5	thin	2	S by E	2	,715	
	11.	A								
4	8.	P 29,544	83	83	thick	5	SE by E	2		(b)
5	7.26	A D New								(c)
6	11.	P 29,578	82,2	80,9	thin	6	SE	2	,719	(d)
	6.30	A 29,528	80,9	80,9	thick	9	E by N	2		
	11.	P 29,588	82,3	80,3	thin	5	SW by S	2	,271	(e)
7	8.30	A 29,580	82,3	83	thick	10	W by N	2		
	2.15	P 29,520	83,7	90,2	thick	9	SSE $\frac{1}{2}$ E	3	,066	(f)
	11.	P 29,600	83,5	81	thick	10	S by W	2	1,000	
8	6.	A 29,592	80,5	78,5	thick	10	S $\frac{1}{2}$ W	2	,546	(g)
9	7.50	A 29,750	80	79	thick hard	10	SW	2		(h)
	0.50	P 29,735	80	86	thick	8	S	2	,293	
10	6.20	A 29,700	80,5	81	thick thunder	3	S by E	2		
	1.15	P 29,66	84,3	90,3	thick	6	SSW	3		
11	9.	A 29,638	83	86,3	thick	5	SSW	3		
	2.15	P 29,574	86	92,5	thunder	7	S by W	3		
12	7.50	A 29,608	83,6	87,3	thick	8	S $\frac{1}{2}$ E	2		
	2.15	P 29,564	86,5	91,5	thunder	10	S $\frac{1}{2}$ W	2	,070	(i)
13	7.	A 29,606	81,5	82,2	thick	9	WNW	3	,014	(k)
	11.24	A D F. Q.								
	2.15	P 29,550	82,8	86,5	thick thunder	10	S by E	2	,400	
14	7.45	A 29,544	81,5	82	thick	10	NW	2	,196	(l)
	2.20	P 29,466	84,5	89,5	thick	8	E $\frac{1}{2}$ N	1		
15	7.45	A 29,498	82,7	84	thick	6	SSE	3		

Day.	Time.	Barometer.	Hygrometer.	In.	Out.	Kind.	Quant.	Quarter.	Force.	August 1785, Miscellaneous.
16	7. P	29,468	61,5	83,5	86	thick thunder	10	E by N	2	(m)
	7.45 A	29,528	65	82,8	83,2	thick	5	NE $\frac{1}{2}$ E	3	
17	2.15 P	29,460	57,5	85	87,3	thunder	10	NNE	4	(n)
	7. A	29,472	64	81	80,2	thick loofe	10	NE	2	(o)
18	2.10 P	29,493	61,5	84,5	88,2	thick	8	SW by S	5	
	6.15 A	29,580	63	80,5	78,5	loofe	10	S	3	(p)
								Carried forward		5,521

(a.) About 1. P. it rained very heavily in town; and very little here; the quantity is noted. 2. P. Distant thunder.

(b.) This fell in a very short time. In town there was only a sprinkling.

(c.) It was very gloomy in town all the forenoon; and we had two small showers, but not any at the gardens.

(d.) Of the water 5 fell last night, the rest in the forenoon to-day.

(e.) It rained almost the whole day small rain.

(f.) Rain in the forenoon. 11. P. And still raining hard.

(g.) It has rained almost incessantly all night long; and still rains, though it is going off.

(h.) It rains very heavily. The mercury is in a falling state, so that it has been higher.

(i.) This fell in the night about 15. P. and we have had a sprinkling about 11 this forenoon besides.

(k.) This fell about 2 in the morning, with a gulf of wind and some lightning. 2.15 P. Two or three thunder showers since 9, and it now thunders.

(l.) Yesterday afternoon and in the night it rained.

(m.) 2. P. several small showers with thunder.

(n.) 2.15. P. Thunder at a distance.

(o.) Thunder showers yesterday afternoon, and in the night, and rain this morning. 2.10 P. Showers all the forenoon of very small rain, and short duration.

(p.) It has been a very tempestuous night, with frequent showers. It still rains, and the wind was in general 6 and 7 in the night.



Day.	Time.	Barometer.	Thermometer.		Clouds.	Wind.		Rain.	August 1785. Miscellaneous.
			In.	Out.		Quant.	Quarier.		
19	6.50 A	29,578	83	84	Brought forward,	5	SSW	5,521	(q)
20	2.30 P	29,564	88	90,5	fcattered	5	SW by W	,142	
	7. 1.41 F	29,580	83	85	thick	9	SW by S		
21	2.20 P	29,566	90	93	thick	4	SW by W		(r)
	6.10 A	29,576	83	80	ditto	5	N		
	1. 2.15 I	29,625	85	85	thunder	10	NE by E		
	2.15 I	29,578	84	83	ditto	10	ESE	,015	
22	6. 2.15 A	29,588	83	81	thick	9	W by N		(s)
	2.15 P	29,556	85	90	ditto	8	NE by N	,05	
23	6.30 A	29,570	83	81	thick thunder	9	N	,248	(t)
	2.15 F	29,576	83,5	86,8	thick	8	S $\frac{1}{2}$ E	,053	
24	7. 2.15 A	29,596	82	82	ditto	7	E by S	,030	(v)
	2.15 P	29,598	84	86	thunder	9	S by E	,084	
25	6.30 A	29,646	82,5	81,5	thick and thin	9	S by E		
	2.15 F	29,640	85	86,5	thick	9	SSW		
26	7. 2.15 A	29,690	82,8	83	thin	9	ESE		(w)
	2.15 P	29,642	84	81,9	thunder	9	S $\frac{1}{2}$ E	,186	
27	4.03 A	D L. Q							
	6.15 A	29,700	82,5	80	thin and thick	7	SSE	,017	
28	2.25 P	29,688	84,5	88,9	thick	9	S by E	,004	(x)
	7. 2.15 A	29,758	82,0	80,9	loofe	10	SE by E	,200	
29	7. 2.15 A	29,696	81,8	81,8	thick	6	S by E	,214	(y)
	7.10 A	29,704	83	83,2	thin	10	SW by S	,055	
30	2.35 P	29,628	85,4	88,5	thunder	9	S by W		(z)
	5.30 A	29,610	82	80,7	thick loofe	10	WNW		

Day.	Time.	Barometer.	Hygrometer.	Thermometer.		Clouds.		Wind.		Rain.	August 1785, Miscellaneous.
				In.	Out.	Kind.	Quant.	Quarter.	Force.		
31	2.25 P	29.600	63	82.5	81	thunder loose	10	WSW	2	1,707	(aa)
	7. P							Overflow.		1,700 338	(bb) (cc)
Total in August,										10,661	

(q) Rain about noon yesterday, and after it; and the conclusion of the shower yesterday morning.

(r) 1. P. Thunder at a distance; sprinkling rain began. 2.15 P. Thunder over.

(s) 2.15 P. Rain about 8 A.

(t) Thunder showers since last observation. 2.15 P. Several showers of short duration since last observation. Tides high.

(v) 2.15 P. Several small showers with thunder.

(w) Rain with thunder yesterday afternoon. 2.25 P. A small shower just over.

(x) Rain now falling, and some fell in the afternoon yesterday.

(y) Rain yesterday before sun-set.

(z) Rain in the night. 2.35 P. It has thundered this forenoon; and being then dead calm, the heat was almost insupportable. 2.25 P. The gage cistern holds only that quantity; how much fell I know not, but I think as much more.

(aa) The water measured to-day fell in about an hour. To-day I measured the cistern, and it holds only 1,707; and through the air-hole there runs out one-tenth in 40". It is impossible, therefore, to ascertain what did fall to-day; but that it had run out was evident; and from circumstances I judge the quantity was as much as was measured.

(bb) Add 1,700, it could not be less, as there was a great deal of water in the garden: and besides, I know from a canal that its water rose 3-4. Yesterday it was 1.5 below the drain; this afternoon the water ran through the drain two inches deep, and yet only three-tenths of rain fell in the afternoon.

(cc) This fell in the afternoon.



Day.	Time.	Barometer.	Hygrometer.		Thermometer.		Clouds.		Wind.		Rain.	September 1785. Miscellaneous.
			In.	Out.	Kind.	Quant.	Quarter.	Force.				
1	5.30 A	29,60	68	81,5	80	thick	5	S by W	2			(a)
2	7.40 A	29,70	66,5	82	82,5	thick	5	S	3		,052	
3	2.30 P	29,67	68	83,5	85	thick	10	SSE	3		,156	
	5.30 A	29,712	71	81,5	79,9	thick	3	SSE	1			
	2.20 P	29,700	65	83	86	thick	6	S by W $\frac{1}{2}$ W	3			
4	10.51 P	D New										
	6. A	29,748	69	82	79,9	thin	5	S by W	1			
	2.20 P	29,730	5,05	85	92	thick	6	S by W	2			
6	6.15 A	29,772	55,5	83,5	82	thick scat.	6	SSW	2			
	2.25 P	29,734	46,5	88	91	thunder	7	SW by W	4			(b)
	5.40 A	29,720	55	84	82,2	thin and thick	6	SSW	3			
7	2.30 P	29,714	45	87,5	89	thunder	9	SSW	3			(c)
	5.40 A	29,716	55	84	81	thin	3	S by W	2			(d)
	2.10 P	29,730	45	83	82	thin	3	S $\frac{1}{2}$ W	1			
10	7.30 A	29,820	54	87,5	92	thunder	5	SW by W	2			(e)
	2.25 P	29,784	48	84,8	85	thin and thick	6	S by E	2			(f)
	7. A	29,782	5,55	88	92	thunder	9	SSW	3			
12	1.55 A	D F. Q.	50,5	83	81,5	thick	9	N by E $\frac{1}{2}$ N	2			(g)
	6.10 A	29,720	55	86	88,5	thunder	10	SW by S	3			
	2.10 P	29,668	53,5	83,5	80,2	thunder	6	SW $\frac{1}{2}$ S	2	,582		(h)
13	5.55 A	29,650	57	84	92	thick	9	S by W	2	,185		(i)
	1.20 P	29,592	55	87	93	ditto	7	SSE	2			
	7.10 A	29,655	56,5	83,3	81,9	thick heavy	9	ESE	2			(k)
15	2.10 P	29,608	52	86	89,5	foggy	10	SE by S	2	,010		
	5.50 A	29,600	56,5	82	80	thunder	8	E by N	4	,002		(l)
	7.15 A	29,648	56,5	82	81	loofe	7	E by S $\frac{1}{2}$ S	3	,001		
16						thin	4		3	,128		(m)

Day.	Time.	Baromet.	Thermometer.		Clouds.		Wind.		Rain.	September 1785. Miscellaneous.
			In.	Out.	Kind.	Quant.	Quarter.	Force.		
16	2. P	29,616	84	86	thunder	5	E $\frac{1}{2}$ S	2	,590	(n)
	8 40 P	29,659	83	82	thin	5	SE by E	3	,110	
17	6. A	29,630	82	80	thin	9	SE by E	2	,003	
	2.25 P	29,628	85	82,5	thick	10	E by N $\frac{1}{2}$ N Carried forward,	1	,001	
									1,820	

(a) A shower about 1 in the morning, with violent wind. 2.30 P. A shower about 10.

(b) Diffant thunder.

(c) 2.30 P. We had a sprinkling of rain at 11, and some thunder since.

(d) Yesterday it rained hard at Dumdum, and to-day there was a very smart shower in Calcutta; only a sprinkling here.

(e) 2.10 P. Diffant thunder, but approaching from the SW to SSE.

(f) About and until sun-set we had a double rainbow, but the rain was only in scattered drops.

(g) 2 P. Loud thunder in the NE.

(h) At  $\frac{1}{2}$  past 4 we had heavy rain from the SW. with lightning. 2.10 P. Rain about 9 o'clock.

(i) A sprinkling just over.

(k) We had a great deal of thunder last night, sprinkling rain and dead calm till day-break. 2.10 P. We had two or three sprinklings, and some thunder.

(l) A sprinkling in the afternoon about 3 P.

(m) This water fell yesterday, and it did not rain in town. 2 P. At  $\frac{1}{2}$  past 12 a very heavy shower gave this water in less than 20 from SE 5. 8.40 P. This water fell about sun-set, from which time the sky began to clear.

(n) This fell in the night. 2.25 P. A sprinkling in the forenoon.



Day.	Time.	Barometer.	Hygrometer.	Thermometer.		Clouds.		Wind.		Rain.	September 1785, Miscellaneous.
				In.	Out.	Km.	Quant.	Quarter.	Force.		
18	6. A	29,648	58	81	80,5	Brought forward,	8	E by N $\frac{1}{2}$ N	2	1,820	(o)
	7. A	29,664	58	81	80	loose	10	ditto	2		
	2 20 P	29,613	56	84	85	ditto	10	S by E	3	,056	
	9.57 P	D Full									
19	6. A	29,590	59	81	80	thick loose	10	E by S	2	,003	(p)
	2.15 P	29,588	61	83	87,2	thick heavy	10	S by W	2	,002	
20	6. A	29,580	62	81	80	thick loose	10	SE	2	,281	(q)
	2. P	29,576	59	84,5	89	thick	8	S by E	3	,163	
21	7.50 A	29,687	61	81	81,5	thick	9	E by S	4	,387	(r)
	2.25 P	29,666	60,5	84,3	87	thick	10	SE by S	4	,084	(s)
22	6. A	29,754	62	81	79,8	thick	3	E by N	4	,016	
23	7. A	29,756	62	80	80,8	thin	4	NE	1	,270	(t)
	1 30 P	29,728	58	84,7	88,8	thick	6	NW	1		
24	8.15 A	29,723	62	83	84,5	thick	9	NW	3		
	2.15 P	29,636	55	86	89,5	thick	8	NNW	3		
25	8.50 A	29,668	53	83	84	thick	5	E by S	4		(v)
	2.15 P	29,583	53	84,3	86	thick	7	ESE	4	,154	
	2.21 P	D L. O.									
26	8. A	29,666	58	80,8	81,2	thick loose	5	ENE	3	,395	(w)
	2. P	29,608	58	82	84	thick	9	SSE varying to S by W	5	,291	
27	7.45 A	29,641	61	81	81,8	thin	5	SE	3	,018	(x)
	2.25 P	29,573	59	82	81	thick	10	SW	3	,130	
28	7.20 A	29,600	60	81	81	ditto	9	SE by S	5	,130	(y)
	2.15 P	29,556	62	83	85,5	ditto	10	SSE	5	,009	
29	6.30 A	29,638	63	81	79,5	ditto	10	S by E	2	2,640	(z)

Day.	Time.	Barometer.		Hygrometer.		Thermometer.		Clouds.		Wind.		Rain.	September 1785, Miscellaneous.
						In.	Out.	Kind.	Quant.	Quarter.	Force.		
30	6.30 A 12. P	29,680	61	78,2	79,9			thick hard	4	SW $\frac{1}{2}$ W	3	,182 ,001	(aa)
Total in September,												7,052	

(o) 7 A. A small rain. 2.20 P. Rain in the forenoon, several small showers.

(p) This fell yesterday before sun-set. 2.15 P. Rain in a short sprinkling this forenoon.

(q) Rain yesterday evening, and in the night; it still rains scattered large drops. 2 P. Rain in the forenoon.

(r) Rain with thunder at 5 P. again in the night twice, and since day also. 2.25 P. Two or three showers since last observation.

(s) Rain the afternoon yesterday. Rain twice to-day.

(t) 1.30 P. The wind has varied round and round, though hardly perceptible.

(v) The night was dead calm till about an hour before dawn, and then we had a storm from NE with lightning. 2.15 P. A shower just over.

(w) Rain at 4 A. and again at sun-rise. 2 P. Flying showers all the forenoon.

(x) Rain yesterday afternoon. 2.25 P. Several smart showers since last observation.

(y) A very stormy night, with frequent showers. 2.15 P. Two or three showers since morning, but all momentary, and small.

(z) Before 11 o'clock P. we had rain 15. Between 12 and 1 there came on a violent rain, attended with thunder, lightning, and wind, which varied round and round: it produced 1,25: before 3 1,20, and the rest since. It still lowers and threatens.

(aa) Several showers yesterday, and one in the night. 12 P. A sprinkling to-day.





Day.	Time.	Barometer.	Thermometer.		Clouds.		Wind.		Rain.	October 1785. Miscellaneous.
			In.	Out.	Kind.	Quant.	Quarter.	Force.		
12	7.15 A	29,902	81,2	81	thin	2	W $\frac{1}{2}$ N	1		(f)
	2.15 P	29,868	84,3	87,5	thick	6	NW	1		
13	6.30 A	29,900	81,5	79	thin	2	NW $\frac{1}{2}$ W	2		
14	7.    A	29,894	81,5	80			W by S	2		(g)
	2.20 P	29,848	84	88,9	thick	8	WNW	2		
15	7.    A	29,892	82	79,9	thunder	3	NW by W	2		
	2.15 P	29,878	86	89	thick thunder	6	NW $\frac{1}{2}$ N	3		
16	6.45 A	29,848	81,5	80	thin	4	N	2		
	2.25 P	29,897	86	88,5	thick	6	N	3		
Carried forward, 1,391										

(a) 5.30 P. Rain in the north.

(b) 2.20 P. Very sultry.

(c) There was much lightning in the north, with distant thunder, and at 4 we had a thunder shower.

(d) A thunder shower about sun-set. 2.25 P. Rain began at 3, and continued till near 9: it came from the NE. with a very sudden change.

(e) Whether this was rain or dew I do not know.

(f) At 6.30 A. The thermometer out of doors 78,7.

(g) Thunder at a distance twice this morning.



Day.	Time.	Barometer.	Hygrometer.	Thermometer.		Clouds.		Wind.		Rain.	October 1785, Miscellaneous.
				In.	Out.	Kind.	Quant.	Quarter.	Force.		
17	6.20 A	29,928	50	80,7	78,2	Brought forward,		N by E $\frac{1}{2}$ E	2	1,391	(h)
18	2.5 P	29,885	42,5	85	86,5			N	4		
	6.46 A	D Full						N	1		(i)
	6.50 A	29,914		79				N	3		
19	2.30 P	29,878		86				NNE	2		
	6.30 A	29,872		79				N	1		
	2.30 P	29,856		86				N	2		
20	7.30 A	29,900		80		thick	10	N	2		(k)
	2. P	29,832		86		thin	5	N	2		
21	8. A	29,92		81,7		ditto	3	N Eaffly	3		
	2.30 P	29,864		87,5		thick and scat.	5	N	4		
22	6.20 A	29,884		78				N	3		
	2.40 P	29,828		87				NNE	4		
23	6.20 A	29,892		77,5		thin	4	N	3		
	2. P	29,864		87		thin	3	NE	3		
24	7.10 A	29,936		79,5		thin	6	NNE	2		
	2. P	29,903		85,5		thin	4	NNE	2		
25	4.45 A	D L. Q.									
	6.30 P	29,913		78,5		thin	4	NE	9		
	2.10 P	29,900		88		thick scat.	3	N	2		
26	6.40 A	29,874		80,5		thick and thin	4	NE	2		(l)
	1. P	29,860		88		thunder	8	SE	1		
	1.25 P	29,866		86		ditto	9	SE	4		
	1.40 P					ditto	10	SE	6		
27	7. A	29,840		78,5		thick loose	10	NNE	1	,920	(m)
	2. P	29,780		83		thick	10	NE	2	,456	
28	7. A	29,724		77		loose foggy	9	NNE	3		

Day.	Rain.	Oct. 1785, Miscellaneous.
30	,084	(n)
31	,012	(o)
Total in October, 2,863		

(h) 2.5 P. Quitted the gardens this evening.

(i) First observation at Calcutta.

(k) The clouds began to collect yesterday about 9 A.

(l) Foggy. 1 P. Distant thunder. 1.25 P. Ditto, and rain coming on. 1.40 P. Rain began in large drops.

(m) The rain fell heavily, and continued till about 3, and produced the water above at the gardens. It has rained in the night, and I heard it at day-break, and it drizzles now. 2 P. Smart rain. This water was measured in the morning.

(n) Rain at day-break.

(o) Rain at noon.



Day.	Time.	Barometer.	Hygrometer.	Thermometer.		Clouds.		Wind.		Rain.	November 1785. Miscellaneous.
				In.	Out.	Kind.	Quant.	Quarter.	Force.		
2	7.15 A	29,947		80		thick	4	N	1		
	9.33 A	D New									
3	2.30 P	29,912		85,5		thick	8	ESE	3		
4	8.30 A	29,964		80				N	2	,003	(a)
	8.15 A	29,936		79,3		thick	6	NE	3		
	2.30 P	29,840		81,7		thick	8	E	3		
5	9.	29,924		78,3		thick	10	N	3		
	2.20 P	29,802		82,3		thick	9	N	2	,001	(b)
6	6.40 A	29,850		78		thick	8	E	1	,019	(c)
	2.20 P	29,820		81,8		thick	10	NE	1		
7	7.40 A	29,914		78,3		fluffed	6	N	2		
	2.15 P	29,900		83		thick	8	NNE	2		
8	7.	29,932		78,8		thick	10	NE	1		(d)
	2.10 P	29,881		79,5		thick	10	NE	3		
9	7.	29,940		74,3		thick	9	N	2		
	2.10 P	29,896		77		thick	8	NNE	3	1,000	(e)
10	1.43 A	D F. Q.									
	7.40 A	29,936		73,8		none		N	2		
	2.	29,936		77,8		white scat.	3	NW	2		
11	7.	30,022		74				N	2		
	2.	29,988		80		thick white scat.	6	NW	2		
12	8.	30,118		75		thick	3	NNE	2		
	2.30 P	30,036		79,3		thick	4	NNE	2		
13	8.	30,118		74,3		thick	3	N	3		
	2.	30,062		79		scattered	3	N	4		
14	7.	30,082		71				N	3		

Day.	Time.	Barometer.	Thermometer.		Clouds.		Wind.		Kan.	November 1785 Miscellaneous.
			In.	Out.	Kind.	Quant.	Quarter.	Force.		
14	2.25 P	30,024	78				NNW	3		
15	7.35 A	30,005	70,5				NW	3		
							Carried forward		1,023	

(a) A small shower at the gardens.

(b) Small rain : the produce at the gardens.

(c) It rained last night, and the water was measured this morning at the gardens. 2. 20 P. At noon there was a smart shower of rain.

(d) Very gloomy, and about to rain. 2.10 P. It began to rain about 8 o'clock, and it continued till near 2. The sky begins to brighten a little.

(e) Yesterday at 3 P. it began to rain, and about 4 P. to blow, and the wind increased to great violence from the N. and NE. About 7 P. a blast broke the pipe of the water-gage, at which time there was 0,5 in the cistern ; and the quantity that fell afterwards was estimated at 0,5. The rain was heavy at times, and continued till 1 the next morning.

(f) Thick fog going off.





Day.	Time.	Barometer.	Hygrometer.	Thermometer.		Clouds.		Wind.		Rain.	November 1785 Miscellaneous.
				In.	Out.	Kind.	Quant.	Quarter.	Force.		
30	6.40 A	29.977		66	59			N	3		
	2.30 P	29.940		77.3				NNW	3		
								Total in November,	1,023		

(g) The thermometer was in the sun.

(h) Thin fog.

(i) This morning was very cold, but I did not observe.

(k) It rained about 3 in the morning.

(l) Very sharp wind abroad.

(m) One very small cloud. 7.10 A. Foul sky in the West. 2 P. Not a single cloud to be seen; the small stripe went off before 8, and the whole day has been delightfully pleasant.

(n) Yesterday ended as delightful as it was at noon; and to-day promises to be just as fair and pleasant.



Day.	Time.	Barometer.	Hygrometer.	Thermometer.		Clouds.		Wind.		Rain.	December 1785, Miscellaneous.
				In.	Out.	Kind.	Quant.	Quarter.	Force.		
1	6.45 A	29,988		66,5	61	thin	2	W	2		
2	2. P	29,976		78,2		scattered	3	NW	2		
	2.42 A	D New									
3	7.15 A	29,956		67	62	thick & thin scat.	5	W	2		
	2. P	29,944		77,5				WNW	4		
	7. A	30,00		69	64	thin	4	WNW	2		
4	2.20 P	29,86		77		thin	4	N	2		
5	7. A	30,032		66,4	59			N	2		(a)
	7. P			65	74			N	2		(b)
6	7.10 A	29,070		68				WNW	2		(c)
7	7. A				67,5			WSW	2		(d)
8	6.40 A				68			WSW	3		
9	6.30 A				52			WNW	2		
	10.46 A	D F. Q.									
10	2.20 P	30,044		79,5	77,5			WNW	3		(e)
15	6.30 A	29,966		57	51						
16	11. P	30,060		58							
	4.30 A	D Full									
	6. A	30,050		53	48,5			NNW	3		
17	2. P	30,040		76,3	74,8	thick	8	W	1		(f)
	6. A	29,977		62	53	thick					
18	2. P			67	73	thin	5	NW	2		
	6. A			62		thin	5	NW	2		
19	6. A	29,963		67	52	thin	5	N	2		
	2. I	29,944		78	78	thin	6	N	3		
20	2.20 P	29,976		77	78	thin and thick	6	ENE	3		(g)
21	7. A	30,00		58	53	thick	4	E	3		(h)

Day.	Time.	Barometer.	Hygrometer.	Thermometer.		Clouds.		Wind.		Rain.	December 1785, Miscellaneous.
				In.	Out.	Kind.	Quant.	Quarter.	Force.		
22	2. P 6.30 A	29,944 30,012		78,5 57,8	77,5 58	thick	8	NE N	2 2		
23	1. P 7.20 A 2.35 P 8.01 P	30,025 30,003 29,965 D L. Q	45	79,5 64,5 72	76 61 75	thick none	9	N NNE NNW	3 2 2		
24	7. A	30,024	43	67	60			NW by N	3		(i)
25	6.04 A				59,5			NNE	3		
26	6.30 A				55			NW	2		
27	6.30 A				55			WNW	2		
29	2.30 P 8. A 2.40 P 6.31 P	29,934 30,888 30,002 D New		69 71,2	73 59 74,7			WNW NW by W WNW	3 2 3		

(a) At Purree Baugh.

(b) Foggy.

(c) Foggy.

(d) At Dum Dum in tents; thermometer wet with the dew.

(e) Very thick fog.

(f) Last night the wind was South of the West. At the gardens.

(g) In the morning it was E. 4.

(h) Excessive fog, but going off.

(i) At the gardens.



Day.	Time.	Barometer.	Hygrometer.	Thermometer.		Clouds.		Wind.		Rain.	January 1786, Miscellaneous.
				In.	Out.	Kind.	Quant.	Quarter.	Force.		
1	7.	30,128		72,5	60			WNW	2		(a)
3	8.	30,116		70	63,5			W $\frac{1}{2}$ S	2		
4	8.	30,114		69,7	62,5			W by N	2		
5	1.10	30,064		71,5	74	thin	5	WNW	2		
6	8.48	30,144		69,5	66,5	thin	6	NW	2		
7	8.	30,212		69	61		2	N	3		
	2.30	30,172		75,5	75			N $\frac{1}{2}$ W	3		(b)
	8.10	30,248		68,5	59			NNW	4		
	6.37	D F. Q.							3		
11	2.	30,042		69,5	73,5			N	3		
12	9.	30,107		64	61	thin	2	NW	3		
	3.	30,004		72	73	thick	3	NW by N	2		
13	8.30	30,078		59,5	66,5	none		NW	3		(c)
	2.15	29,998		69	73			WNW	2		
14	8.	30,124		67,6	57			NW	3		
	2.15	30,074		70	72,5			WNW	3		
15	7.30	30,124		66	56,5			NW $\frac{1}{2}$ N	3		
16	2.30	30,050		70,5	72,3			NW by N	3		
	6.	D Full			52			NW	3		(d)
17	2.20	30,124			78			NW	3		
	6.				50			NWN	3		
18	2.				79			NW	3		
19	6.				49			NW	3		
	7.	30,040		66,5	56,5			NW	0		
20	2.20				82			WNW	2		(e)
	6.30				50			W	4		
	2				80			W	4		

Day.	Time.	Barometer.	Hygrometer.	Thermometer.		Clouds.		Wind.		Rain.	January 1886. Miscellaneous.
				In.	Out.	Kind.	Quant.	Quarter.	Force.		
22	5.42 P	D L. Q.			47			N	3		(f)
23	6. A				50			ENE	2		
24	6. A				60			S	2		
25	6. A				68			NW	2		
26	7. A				84						(g)
27	2. P				64			W	1		
28	2. P				87			NE	3		
29	7.45 A				65			NNE	3		
30	2.50 P	D New			85						(h)
	8.00 A							WSW	1		
	8.32 A				64	thick scattered	4	NNE	4		
	2.35 P				83						

- (a) A fog so thick hardly any thing is visible.
- (b) To-day at day-break it was 52 at Dum Dum.
- (c) Foggy, and piercing by cold.
- (d) Fog, and thermometer wet : the air mild to the feeling.
- (e) Foggy.
- (f) Thermometer wet with dew.
- (g) Thermometer wet with dew.
- (h) Sun eclipsed, going off.



Day.	Time.	Barometer.	Hygrometer.	Thermometer.		Clouds.		Wind.		Rain.	February 1786, Miscellaneous.
				In.	Out.	Kind.	Quant.	Quarter.	Force.		
1	7 15 A.	29,994		72,3	67	thick	3	SW	2		(a)
2	6 50 A	29,927		69,5	66			SSW	3		(b)
3	7 45 A	30,036		67,5	63,5			N by W	3		
4	2 30 P	30,009		76	75			NW	4		
	6 30 A	30,047		67	55			WNW	3		
6	2 30 P	30,060		77	75			NW by W	4		
	2 22 A	D F. Q.									
	6 40 A	30,100		67	58,5			W	3		
	2 50 P	30,078		78	77			NW	4		
7	7 00 A	30,078		66	57,5			NW $\frac{1}{2}$ N	3		
8	3 30 P	30,020		73	77,5			NW $\frac{1}{2}$ N	3		
	7 15 A	30,068		66	59			NW $\frac{1}{2}$ N	3		
10	6 50 A	30,084		68	58			WNW	3		
	2 40 P	30,087		79	79,3			W by N	3		(c)
11	6 50 A	30,094		69	59			W by N	3		
	2 30 P	30,026		71	80,7			E $\frac{1}{2}$ S	3		
12	7 50 A	30,000		69,3	65,5			N	2		(d)
13	7 30 A	30,000		73,2	68,3			SW by S	2		
	10 35 A	D Full									
	2.	29,956		85,0,	81,3			SW	2		(e)
14	5 50 A	29,970		71,5	66	thick	6	S $\frac{1}{2}$ E	2		(f)
15	1 40 P				86	thick	3	S	4		(g)
16	7.				64	thunder	10	ESE	2		
	2 10 P	29,914		76	79,5			SSW	2	,1600	
	6.									,4200	(h)
17	7 50 A	29,952		70,3	64,3	thick	10	SE	5	,1750	(i)
18	7 40 A	29,992		65,5	61,3	thick feat.	5	NNE	3		
19	8 10 A	30,02		65	65			WNW	4		

Day.	Time.	Barometer.	Hygrometer.	Thermometer.		Clouds.		Wind.		Rain.	February, 1786, Miscellaneous.
				In.	Out.	Kind.	Quant.	Quarter.	Force.		
21	7.40 A	29,892		69	65,4			SW $\frac{1}{2}$ S	3		
22	2.14 P	D L. Q.									(k)
23	6. A	29,882		77	77	thick thunder	7	S	3		(l)
24	8. A	29,970		74	75	thick	10	SSW	3		(m)
25	2.30 P	29,982		76	80,8	thick	6	NW	3	1810	
	8. A	30,062		74	73,5			S by E	2		
26	2.30 P	30,000		78	82	thick	4	ENE $\frac{1}{2}$ N	2		(n)
	7.15 A	30,076		73	69,3	thick	10	NNW	2		
	2.30 P	30,066		78,5	80,5	thick	10	W by E	3		
27	.10 A	30,095		72,5	70,3	thick	10	NW	2		
28	2.20 P	30,058		77	85	thunder	6	W	2		(o)
	8.20 P	D New									
Total in February,										9360	

(a) Excessive fog.——(b) Thick fog rising into clouds.——(c) Foggy.——(d) Excessive fog.——(e) Excessive fog. (f) The clouds have been thick 9, and it looked as if it was about to rain.——(g) Foggy, at Dum Dum. 2.10 P. (At the gardens) thunder coming on, and drawing near. 6 P. Rain had began in drops when last observation was made.——There was thunder, but not any thunder gust.——(h) It has been a very tempestuous night, with excessively heavy thunder, and of very long continuance; the thunder shook the whole house several times.——(i) This fell in the last night.——(k) The wind has been S. 6 the greatest part of the day.——(l) It lightened a good deal till 8 P. and then cleared suddenly.——(m) This water fell in a thunder shower last night, from W and NW. with much lightning, though but little wind.——(n) Much lightning in the former part of the night, and a gust of wind from N about 11.——(o) Very heavy fog this morning, and a mists forming.



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